WILD HORSE

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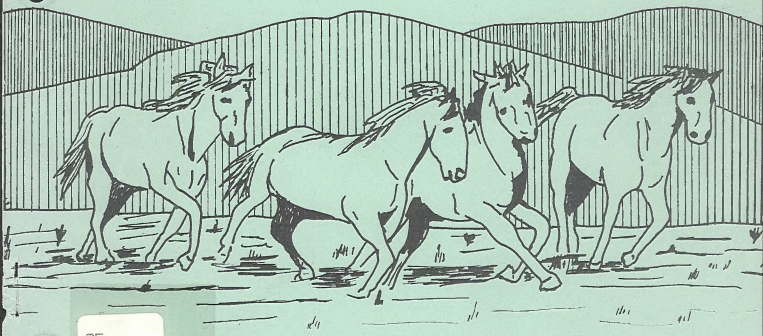

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Pryor Mountain Wild Horse Range

Note: The following data represents what is termed Step 3 and Step 4 of the Unit Resource Analysis in the Bureau of Land Management's Planning System. Step 3 consists of the inventory or identification of all the data available, and Step 4 represents the maximum number of opportunities or alternatives for management.

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It must be understood that the only resource that has been considered at this point is wild horses. Later in the planning system, many of the opportunities will conflict with wildlife, livestock and other resource uses. These conflicts will have to be resolved. The general public is an integral component in this resolving process. How do you want your land managed? If you have specific comments on the data presented or can identify alternatives we have missed, please write to the following address:

Bureau of Land Management
Billings District
Apsuroka Resource Area
P. O. Box 2020
Billings, Montana 59103

or contact us personally for your comments:

Phone (406) 245-6711, Extension 6262
Rex Cleary - District Manager
Ron Hall - Wildlife Biologist

Report prepared by Billings District Office, Ron Hall, Wildlife Biologist.

Appendix

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Abstract

Population dynamics, distribution and behavior data were collected on the horse herd in the Pryor Mountains, Montana. Population data were collected by aging and sexing 124 horses. Additional sex data were collected by using a spotting scope. Distribution and behavior information was collected through observations for one year.

A 10 to 11-year-old horse is considered old in the Pryors. The oldest horse aged was 14. The average age of the herd is 6.4. During the last three years, survival of colts has been extremely low. The sex ratio of the herd was 60% male and 40% female. This was adjusted to 50-50 through the removal of 30 adult males. Young/adult ratio in July of 1971 was 11 young/100 adults. Young/female ratio was 24 young/100 females. In 1972 there were 16 young/100 adults and 24 young/100 females.

Distribution of the horses is dictated by water, forage and weather conditions. The horses have seasonal home ranges but do not establish territories. Home ranges vary in size with the size being dependent upon available forage.

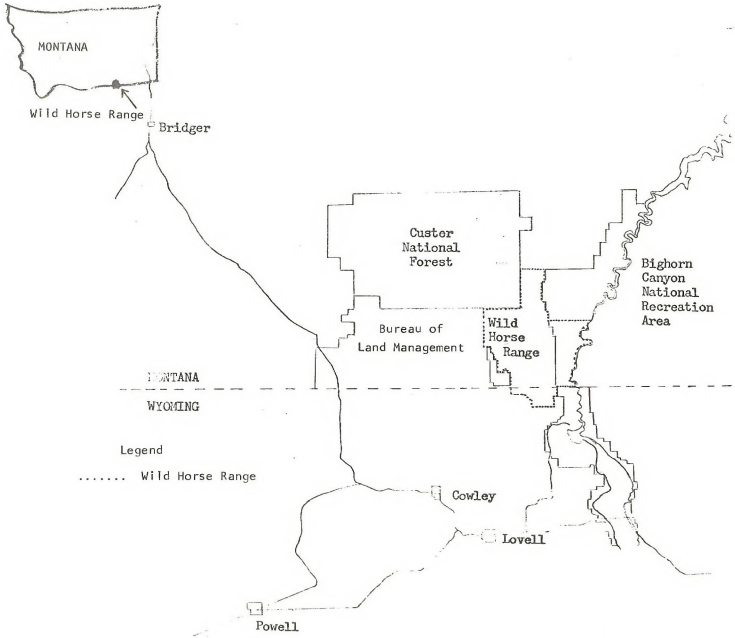
Breeding season seems to be a function of the green-up which brings mares into heat. It extends from late March to mid-July. The peak is the first of May. Gestation period is approximately 340 days with foaling occurring from April 1 to July. The majority of males and females do not breed until at least three.

Average harem group is three to four (3.4) animals. It is composed of a lead mare, a stud whose function is breeding and holding the unit together, and other subordinate animals. Larger harem groups may contain two males and both of them may, on occasion, breed. Males born to the unit are sometimes kicked out as yearlings; other groups may tolerate young males until at least three. Stud groups, composed of young studs not yet capable of obtaining a harem, have a much looser organization The group is led by a dominant stud. Individual members may wander from the group to return later, or they may join another group of all male animals.

Range trend has been sharply downward for several years. The 120-130 horses presently on the range are too many for the available forage.

Some competition exists between mule deer and horses, especially on intermediate browse species.

Management will consist of population control and proper distribution. Distribution will be accomplished by water manipulation and/or fencing. In the future, other management methods will be tried as they are developed.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Bridger
Custer
National
Forest
Bighorn
Canyon
National
Recreation
Area
Bureau of
Land Management
Wild
Horse
Range
MONTANA
WYOMING
Legend
..... Wild Horse Range
Cowley
Lovell
Powell

URA - Step 3

I. HISTORY - HORSE

A. General

The wild horse can be biologically classified as an "exotic" animal in North America. Some of his ancestors, such as the diminutive "Dawn Horse" or Eohippus lived on this continent around 60 million years ago. Part of the evolutionary line of descent occurred here, but the changing environment placed the horse on the "extinct" list in North America. The horse was reintroduced to the Americas in the 15th Century by Spaniards.

B. Pryors

Information on when the wild horse first appeared in the Pryors is unrecorded in available literature. Many conflicting reports have been obtained from area residents. They range from "They have been here forever" to "...about 1900." William Hamilton, a trapper, roamed through the Pryors in 1848 and recorded many of his observations. He did not report seeing free-roaming horses. This is not meant to infer that they were not here. A map of the spread of the horse in Wyman's "Wild Horse of the West" indicates that horses could have been in the Pryor Mountain area in the early 1700's.

A photograph of a roundup conducted on the Dryhead around 1910 is the earliest definitive record available. It may be assumed that these horses were in the surrounding country quite some time before this date.

Again, Wyman in "The Wild Horse of the West" points out the establishment of a wild horse population in Arizona and their ultimate explosion within 5 years. The date was 1878-1883. All the horses came from the domestic horses brought in by ranchers. It might be assumed that a parallel of this situation occurred in the Big Horn Basin and the Pryor Mountains! However, it is possible that some horses escaped from local Indian tribes.

"In 1927 the Wyoming Legislature authorized the county commissioners to conduct horse roundups. That the removal was still going on in the early 1930's is evident from the report that one buyer shipped from the Big Horn Basin 22,000 horses in 1933 and 1934." The Pryor Mountains are on the north flank of the Big Horn Basin.

During the era of the commercial mustangers, most of the horses were rounded up. Bands of horses were left in remote rugged country due to the difficulty of rounding them up. The Pryors is one such area and in the immediate vicinity the McCulloch Peaks south of Powell, Wyoming.

At the demise of commercial mustanging, mustanging for sport was again popular. This practice is as old as white man's first contact with the horses of the plains or the Indian's interest in keeping a herd. Man has always exerted a controlling influence on horse populations.

II. DESCRIPTION OF THE PRYOR MOUNTAIN WILD HORSE RANGE

A. General Description

The Pryor Mountains lay on the north flank of the Big Horn Basin extending approximately 6 air miles north of Warren, Montana, to 12 air miles north of Lovell, Wyoming. This area is largely within the rain shadow created by the Beartooth Mountains to the west. The wild horse range encompasses the southeast portion of the Pryor Mountains.

The horse range is bounded on the east by Bighorn Canyon, on the south by private land, on the west by Crooked Creek, and on the north by BLM, Forest Service, and National Park Service lands.

In September of 1968, the wild horse range was established by Secretarial Order F. R. Document 68-11056 (Copy Appendix 1).

B. Physical Features

1. Topography

Elevations within the range vary from 3900 feet at the lower extremities to 8000 feet at the northeast corner of the range. The area is characterized by deep, steep-walled canyons, isolated, grassy plateaus and foothill slopes which form an outstanding feature in the topography. A thick layer of porous limestone underlies the majority of the horse range.

Warming of the south and southeasterly exposures and persistent winds keep the ridges free from snow the majority of the winter.

In general, topography does not limit utilization of the range by horses. Essentially, all the range is grazed.

2. Soils

Appendix 2 soil groups.

The majority of the soils in the Pryors are quite young with many containing undecomposed parent material. A major exception to this is the soil derived from the Chugwater formation. This soil is very deep. Alluvial soils along some of the major drainages are also deep.

3. Vegetation

a. Present Condition

Within the horse range the dominant shrubby plants are curlleaf mountain-mahogany (Cercocarpus ledifolius) and Utah juniper (Juniperus osteosperma). There is also a considerable quantity of big and black sagebrush. The dominant plant within the juniper, shrubs and bush types (Appendix #14) is curlleaf mountain-mahogany with an interspersion of Utah juniper. West of this, Utah juniper forms a definite aspect and is intersperced with stands of low sagebrush (Artemisia arbuscula), black sagebrush (Artemisia nova), and big sagebrush (Artemisia tridentata).

The variations found in the understory of these two major types is considerable. In the curlleaf mountain-mahogany type, birdfoot sagebrush (Artemisia pedatifida), tufted

rockmat (Petrophytum caespitosum), winterfat (Eurotia lanata), stemless goldenweed (Haplopappus acaulis), halogeton (Halogeton glomeratus), Hood's phlox (Phlox hoodii), blue grama (Bouteloua gracilis), bluebunch wheatgrass (Agropyron spicatum), sandberg bluegrass (Poa secunda) and Indian rice grass (Oorhyzopsis hymemoides) are common associates.

In the Utah juniper type there are subdominant shrubs of low sagebrush, black sagebrush, and big sagebrush occurring in various degrees of dominance. In addition, bud sagebrush (Artemisia spinescens), shad scale saltbush (Atriplex confertifolia), fourwing saltbush (Atriplex canescens), and Nuttall's saltbush (Atriplex nuttallii), rabbitbrush (Chrysothamnus nauseosus), and greasewood (Sarcobatus vermiculatus) are found at lower elevations of the juniper belt. Subdominant herbs and grasses are: stemless goldenweed, halogeton, Hood's phlox, plains prickly pear (Opuntia polycantha), Russian thistle (Salsali kali, bluebunch wheatgrass, Indian rice grass, blue grama, squirreltail (Sitanion hystrix), red three-awn (Aristida longiseta), June grass (Kholeria cristata), needle and thread, and sandberg bluegrass are common associates.

The most important grass species to the horses are: bluebunch wheatgrass, June grass, sandberg bluegrass, threadleaf sedge and alkali sacaton. The shrubby species that receives the most use is big sagebrush.

No use has ever been noted on the most important deer food plant, curlleaf mountain-mahogany.

Range condition can be rated at extremely poor to poor over the majority of the horse range. Appendix #3. Year-long grazing by too many animals has deteriorated the forage supply and much of the soil has been lost as a result. (Vegetative Types - Appendix #14). Thirty-three vegetative types have been identified with 85 HU's carrying capacity. (HU = Horse Unit)

b. Past Use

Past animal use is not well documented within this section of the Pryor Mountains. It may be assumed that domestic sheep grazed over this area during the early 1900's, but the level of use cannot be determined. Wild horses have used this land at least since the early 1900's. Again, records of use are non-existent. The area north of T. 9 S., R. 28 E., sec. 26 was a part of the grazing privileges attached to the old Sorensen Ranch. A fence crossed the north part of sec. 26 and was an effective barrier to horse movement until late 1966 or early 1967. With the Secretarial Order of September 1968, the land was included within the legal boundary of the wild horse range.

Even though documentation of past use, prior to 1968, is not available, the history of use can be easily read on the face of the land. Every hill has numerous trails stamped into it, rills, pedestalled plants, hollow center bunchgrass plants, invasion of halogeton, Russian thistle, broom snakeweed and other undesirable forage plants indicate the use made of this land.

c. Trend

Nineteen range trend plots have been established in the horse range. Except for two plots, these studies have been in for three years. The majority of these plots indicates a downward trend over this period of time. In 1958, the Deming two-phase study was done in the Pryors, then again in 1963. This indicated a sharp downward trend over these 5 years. The most severe deterioration has occurred within area 3 in the last three years. (Appendix #14)

d. Potential

The horse range is an arid area with a high ppt/evaporation ratio and a high percolation rate. Annual average precipitation is approximately 9 inches in the low country. See Appendices 5 and 6.

The potential of the horse range is not high and is limited by available soil. On some sites soil loss has been extreme and bedrock is all that is left. Areas 3 and 5, Appendix 4, have the highest potential for improvement. Areas 2, 4 and 7 do not have as high a potential but can definitely be improved. Areas 1 and 8 are presently in fair condition. Range recovery will be a slow process.

4. Water Sources - Appendix #7

a. Permanent

1. Springs

Four permanent springs are located within the horse range. Three of these are located near the southern boundary and

originate from the same aquifer. They are used extensively by the horses during the summer and early fall. The other spring is located in a narrow, steep-walled canyon and is largely unavailable.

2. Perennial Streams

Crooked Creek is a perennial stream which flows along the western boundary of the horse range, and it exits as the boundary line turns east and south. The stream re-enters the range at the extreme southeast corner of the boundary. This stream is accessible to the horses at four points. Three places of access are located along the western boundary, and the other access point is at the mouth of Crooked Creek where it enters Yellowtail Reservoir.

a. Man-made Developments - Water

Three water developments have been constructed within the horse range. The Sorensen Ranch water source was established in September of 1971 and consists of water being piped from a spring to a tank within the horse range. The other two man-made water holes are artificial catchments. The Mystery Cave catchment was established in 1970 while the Tillett Ridge catchment was established in 1971.

b. Temporary Water Sources

The temporary water sources are primarily seeps with three being collected in small basins pawed out by the horses.

The fourth source is water collected in four old mine shafts located adjacent to each other. These temporary water sources are all utilized until they dry up around mid-July.

Water serves as the primary distributive factor of the horses during the spring, summer and fall. During the winter months, snow is available so the horses utilize all of the horse range.

The man-made water sources were not freely utilized until the summer of 1972. One harem of 5 horses established on Mystery Cave catchment during the summer of 1971. Other horses were observed within ¼ mile of the catchment yet they trailed to Britton Springs for water. During 1972, 40 to 50 horses used the Mystery Cave catchment. Man-made waters will become important in the management of the horses. It appears that two or three years may be the necessary adjustment period for a horse to a new development.

Trails to water are dendritic in nature. Tertiary and secondary trails funnel into the primary or trunk trail. Trails are not exclusive to a band of horses but are used by many bands.

During the months of April, May and June the horses will trail a considerable distance to water. Late June, July and August finds many of the horses concentrated on the periphery of water sources. This creates an intolerable degree of use of associated range areas.

C. Cultural Features

1. Physical Developments

a. Management Related

(See Development Map Appendix #8)

In addition to the three man-made water developments, other management facilities have been constructed. The boundary of the range has been fenced using a 5-wire fence where natural barriers do not exist. Cattleguards and gates have been provided as noted on the map.

Two corrals have been constructed, one each located at Britton Springs and Sykes Spring. These corrals serve several functions: 1. water trapping of the horses, 2. working the horses after they have been caught, 3. holding livestock to be trailed up the Dryhead and 4. holding saddle horses.

2. Mining

Uranium exploration and subsequent mining operations have left their scars on the horse range. During the 1950's a uranium "boom" encouraged hundreds of speculators to "stake out" claims in this area. The miners were required to move 100 cubic yards of material annually to "prove up" on their claim. Subsequently, bulldozers were roaming through this area scooping out pits to meet the above requirement. In addition, the miners constructed numerous trails to provide access to their claims.

Tunnel mining for uranium was initiated at one point with four different holes being opened in a small area These were abandoned after a maximum of 100' was tunneled out. These mines now serve as water holes for the horses until mid-July at which time they normally dry up

The uranium was discovered to be of such low quality that extracting it proved to be uneconomical. Today, very little activity is in evidence.

3. Interagency Overlap

Management responsibility on the horse range is shared by two federal agencies. The federal agencies are the National Park Service and the Bureau of Land Management.

Essentially, the National Park Service has the responsibility of administering the recreation while the Bureau of Land Management has the responsibility of grazing management. (Agreement Appendix #17)

However, wild horses and issuance of grazing license are all subordinate to the primary mission of the Bighorn Canyon National Recreation Area. This mission is naturally recreation oriented.

The boundaries of the horse range overlap approximately 3000 acres into Wyoming so two states are also involved.

4. Roads

(See Map Appendix #9).

Existing roads within the horse range are primarily 4-wheel drive trails. One exception to this exists on the east side of the range. A county road traverses the east side of the range, and it is possible to travel it in a passenger car during the summer months.

In 1969-1970 the Bureau of Land Management formulated plans for a recreation complex within the horse range. This plan consisted primarily of a loop road with associated overlooks and picnic sites. A visitor center was also included in the lower area of the horse range. These plans were later abandoned due to knowledge collected on the requirements of the wild horse and a redefinement of land management objectives. Presently no Bureau of Land Management roads are planned within the horse range.

The National Park Service is presently constructing a road that follows closely the alignment of the old Dryhead County Road. This is a high standard "recreation road" to provide access along Bighorn Canyon. This road will also connect Lovell and Fort Smith.

There are some negative aspects to this road development as far as horses are concerned. This centers primarily around the hazard created through horses crossing the road during their daily movements. Of course, the physical removal of vegetation is also detrimental. Potential certainly exists for automobile-horse collisions, particularly at night. Many of the horses will have to cross the road to obtain water. This will occur at two points: 1. the tank of the NE corner of the range and 2. the SE corner where Crooked Creek flows into the lake. One other factor may influence the horses

to hang on the periphery of the road. The rain and snow that fall on the surface of the road will run into the barrow pits and will produce more succulent vegetation than the surrounding country.

The horses that customarily use the Dryhead area have become accustomed to vehicular traffic. This compounds the problem. At night, the horses tend to act somewhat like deer when blinded by light.

If the current seasonal distribution of the horses is maintained, minimal conflict will result between tourist and horses. However, if yearlong arterial traffic uses this route, the conflict will be realized. The horses have been establishing a winter migration pattern into the Dryhead area. Normally, they are out of this area by the time the bulk of the tourists arrives.

A positive point for the road is that it will furnish the recreationists some limited opportunity to view the wild horse.

5. Recreation Development

The only existing recreation development within the horse range is Devil's Canyon Overlook, constructed by the National Park Service.

The Bureau of Land Management is currently surveying a site adjacent to the range for a visitor center and overlook. The roads to this center and overlook will all be outside the horse range. Horses should be observable at all times in the summer from this site. Phase I of construction is planned to begin in early FY 73. This will consist of a road, parking area and overlook.

6. Archaeology

Ancient man used the Pryor Mountains extensively. Many archaeological sites have been located within the horse range. Dr. Larry Loendorf has compiled reports through his studies in the Pryors over the last four summers.

The rich archaeology of this area complements the potential recreation use of the horse range.

7. Wildlife

A report has been compiled by the Bureau of Land Management on wildlife species within the Pryors and their management. Essentially, conflict between the horses and wildlife revolve around the Mule Deer. Most of the horse range lies within critical Mule Deer winter range. (Appendix #10)

Other wildlife species are as follows: elk (infrequently), black bear, coyote, badger, bobcat, blue grouse, Franklin's grouse, chukar and Hungarian partridge, and pheasants on fringe areas.

There are no predators that exert any influence on the wild horse.

8. Livestock

Livestock grazing is not authorized within the wild horse range. Five to six thousand cattle are trailed through the range in the spring and fall. They essentially follow the Dryhead road through the range.

III. PAST DECISIONS

A. Advisory Committee

The Secretary of the Interior appointed an advisory committee to investigate the situation on the Pryor Mountain Wild Horse Range and make recommendations to him for the management of the area. They served from 1968 through September of 1971 until their third annual appointment expired. Their recommendations were sent to the Director of the BLM and are made a part of this report. (Appendix 15)

The committee membership was as follows:

Name	Affiliation
Dr. C. Wayne Cook, Chairman	Range Management Department Colorado State University
Mrs. Velma B. Johnston	WHOA
Mrs. Paul M. Twyne	Wild Horse Protective Association
Edwin Zaidlicz, Co-Chairman	State Director Bureau of Land Management
William Cheney	Executive Director Montana Livestock Commission
Frank Dunkle	Director, Montana Fish and Game Department
Dr. Frank Craighead	Wildlife Research Ins.

B. Roundup

In early October of 1971, the Bureau of Land Management recommended, after thorough analysis of range condition and general health of the herd, that a reduction in horse numbers was imperative. The advisory

committee also expressed their concern and concurred with this recommendation. The first objective, from a humane standpoint, was to remove the colts. It was apparent from the data collected that it was unlikely any would survive the coming winter. Subsequently, 16 colts were removed from the range. A count conducted in mid-July revealed 18 foals. This was a minimum number as a one-shot helicopter flight will not be completely accurate. So, it was apparent after the month-long roundup that some colts had already died. In particular, two that had been caught and tattooed in July were not found.

In November, 79 horses were rounded up by roping and trapping including the above colts. A sex ratio of approximately 60% studs and 40% mares gave the BLM the basis to remove bachelor studs of all ages. Thirty adult males were rounded up. Twenty-eight were given to the Crow Indian tribe, and two branded horses were returned to the owner, Lloyd Tillett.

The colts were turned over to an organization called "WHOA," Wild Horse Organized Assistance. They were cared for by a veterinarian in Lovell, Wyoming, and given away in late March and early April to individuals applying by letter.

IV. INVESTIGATION-RESULTS-DISCUSSION OF HORSE POPULATION STUDY

A. Technique

The first set of objectives was the development of a method of capture, collection of biological data and marking the horses as government property. Sixty-five horses were immobilized using drugs. Results were as follows: eight horses accidentally killed, two horses intentionally killed for a 12% death loss. The particulars of this technique on horses will appear in a separate report.

The second objective was determination of distribution. General distribution was recorded and certain bands were identified for specific distribution and determination of home ranges. Four-wheel drive vehicles, snowmobiles and saddle horses were used with the aid of a spotting scope. In addition, a fixed wing aircraft was used regularly and a helicopter was used occasionally. Behavior was recorded through long periods of observation with a spotting scope.

B. General Description of Pryor Horses

1. Color

The horses in the Pryors defy a general description. The colors are bay, black, brown, sorrel, red roan, blue roan, grulla, blue corn and buckskin. No palominos, pintos or appaloosa are within the horse range.

2. Type

The word mustang is a derivative of the Spanish word mesteno. This term meant wild, estrayed, ownerless animals of the bovine species. Later it came to apply only to horses. Mustang eventually came to mean a type of horse. It was a small, thick-necked, short-backed, tough horse bred on the open range.

a. Mustang - Andalusian and Barb

The mustang was a horse that was selectively bred by nature over time. He was a unique product carved and molded to fit the land. From the time of introduction into North America sometime in the 1500's, his future was being dictated by the selective process.

The American Quarter Horse owes a portion of his ancestory to the chunky, tough, little mustang.

In the 1800's white man introduced many other breeds of horses.

Horses escaped from ranchers and the cavalry and bred with the mustang. Homesteaders who went broke often turned their domestic stock loose, and they joined the wild bunches adding different breeding. Individuals who capatilized economically from the wild horses introduced new blood in an attempt to "upgrade" the wild horse. But even with this tremendous infusion of blood, characteristics of the mustang still showed up in the wild bunches.

In a situation like the Pryors where the diversity of types of horses have been present, the selective process of nature continually provides the type of horses most capable of surviving. As a result, these horses have been gradually reverting back to the original mustang type horse. Evidence of this is the small size of the Pryor horses (females 600-750 lbs., males 800-850 lbs.), the tough, thick hoof wall, the reversion of colors to the blue corn, buckskins and bays with line striped down their back, along their withers and on their legs, and many other factors covered in Step 4 of the Conformation Guide.

Man can aid nature in the selective process if he understands the outward signs of mustang characteristics. When reducing the horse herd, man can speed up the natural culling process by favoring horses with mustang characteristics. In essence, we would be aiding nature in her continuing effort to produce an animal adapted to his environment.

b. Stud Piles

The function of stud piles is still a matter of conjecture. In the Pryor Mountain range they are scattered seemingly at random. Steve Pellegrini in his study in the Wassuk Range indicated that mares and colts also used "stud piles." He indicated that these piles were probably boundary markers. In the Pryors the horses are not territorial so their function is not marking of territories at this time.

Five horses wintered on a wind swept ridge on the Mystic Grazing Allotment north of the horse range. A limited amount of forage was available to them as the area had been grazed in the summer by cattle. These horses were trapped by snow above 8000 feet. It was felt that they would winter kill.

Two trips were made by snowmobile to check on the physical condition of these animals. In February they were extremely thin and lethargic. On both trips extensive dung piles were noticed.

After the green-up we were able to get to the area by vehicle. The extensive dung piles were largely gone. The only conclusion that could be made was that these horses had eaten their own fecal matter to stay alive. The horse, being a simple stomach animal, does not fully digest his food. As such, material with nutritional value still remains in the droppings. These droppings, through behavior, were piled and readily accessible to the horses. To say that the horses piled this fecal material so it would be accessible to them during times of need would be premature at this time.

Kent Gregerson of the National Mustang Association indicated that he thought the horses piled fecal matter so that it would be available to them during extremely hard winters. Maybe so.

c. Hooves

The hooves of the Pryor horses are relatively small but extremely tough. The hoof wall is normally at least twice as thick as the saddle horses we use in the horse range. This is probably nature selecting out the horses with thin hoof walls who are unable to survive in rough, rocky country.

3. Breeding

In general, the breeding season extends from late March to mid-July. The peak is the first couple of weeks of May. The gestation period is approximately the same as domestic horses - 336-340 days.

It is believed that the majority of the mares do not have an estrus cycle until they are three years old. In contrast, horses on good feed can breed at one year old.

The testes of male animals do not descend until at least three. This again in contrast to domestic horses on good feed is two years earlier. This late maturity of the horses in the Pryors may be directly related to their nutritional state.

Domestic horses will breed during any month of the year. There has been some discussion on the adaptability of the horses in the Pryors through adjusting the breeding period and subsequently their foaling period to the most favorable period of time. This "phenomenon" is common among most wild animals in North America.

Mule Deer, Big Horn Sheep, Moose and Antelope, for example, all have different gestation periods; but their peak of giving birth is normally around June 1. This is the most favorable time for the survival of young.

At first glance it seems the horse has accomplished this adjustment in the wild. They have in fact, but it seems to be related to the green-up period of the vegetation. Under a domestic situation if one wants a mare to come into heat, any high quality forage will accomplish it. In the Pryors, green-up during 1972 occurred around the middle of March. At this time the horses are constantly searching out the tender green forage. After several weeks the nutritional state of the horse improves. At this time the mare is physiologically prepared to enter estrus.

Additionally, it is possible that breeding season is a phototrophic response. During 1971, the first colt was observed on April 14. This year, 1972, the first colt was observed on April 11. The majority of the mares are through foaling by mid-July.

4. Age Class

AGE CLASS	NUMBER	% OF HERD
	(Immobilization Study)	
1. Colt	1	1.8
2. 1-3	11	20.0
3. 4-9	37	67.3
4. 10 and older	6	10.9
5. Unknown	1	
	ROUNDUP	
1. Colt	15	18.9
2. 1-3	14	17.7
3. 4-9	42	53.2
4. 10 and older	9	11.3

The data presented on the preceding page were divided into two groups due to a bias in the immobilization study data. Younger animals, especially yearlings, and colts were generally passed up when immobilizing. Also, the males with harems were noticeably more susceptible to immobilization. They were usually at the rear of the group and normally not as alert as the other animals.

If the three-year-olds are thrown out of the roundup data, the one and two-year-olds make up only 8.7 percent of the herd. Only two yearlings were captured. It is obvious that considerable death loss occurred in the younger age class animals in the last three years.

Additional data is as follows:

1971 young/adult and young/female ratios were as follows:

1. 11 young/100 adult 2. 24 young/100 female

1972

1. 16 young/100 adult 2. 24 young/100 female

Average age of studs with harems 7.8

Average age of males as a whole 6.9

Average age of females 5.4

From the data presented, it becomes obvious that there are certain large gaps within the age structure of the population of horses in the Pryor Mountains. This is centered around the inability, apparently, of the younger animals to survive to any extent during the last four years. From the roundup of horses, it was

Determined at that time out of 80 horses that were rounded up there were only two yearlings. There were five 2-year-olds, seven 3-year-olds, and five 4-year-olds. So, it appears that younger animals are just simply not able to survive. As in other animal populations when the range is in a deteriorated condition and when the animals are not receiving the amount of nutrition that they need, the younger animals are the first to suffer. Because they are weaker, they are not as competitive for available forage as the adult animals. Under weakened conditions, they are more susceptible to disease and death by starvation.

This presents a unique problem. It has been determined the average breeding length or reproductive period of adult horses in the Pryors, the females, is approximately from the time that they reach four through nine years old. So, this gives approximately a five-year span in which these horses are reproductively active. Now, assuming that we continue under the present situation without getting survival of the younger animals and assuming that this span is allowed to go on for four to five years, then we will have a gap in the age structure of the population of four to five years. The result of this is that as these animals gradually enter the breeding age of four to five we will be getting noticeably less number of animals born; and if these animals in turn are unable to survive, then this age gap will continue. As this whole

span, say five years, for example, moves into the age class of four through nine, then you will have the entire span of the productive years without having any productive animals on the range. This is going to be disastrous to the horse herd in the Pryors.

5. Sex Ratio

One would expect a sex ratio of roughly 50-50 in a situation like the Pryors. This, however, was not the case. The sex ratio was estimated at roughly 60% males and 40% females during the summer of 1971. This sex ratio was the result of several factors. First, the mare is physiologically placed under more strain from conception through weaning time. Under the extremely overgrazed conditions in the Pryors, the nutritional level of the animal places even more strain upon the mares. In contrast, the males have an easier time, especially if they are bachelor studs or young animals who have not yet obtained a harem.

The present sex ratio is approximately 50-50 due to the removal of 30 adult males during the roundup.

6. Physical Stature of Pryor Horses

It appears that the size of the horses in the Pryors is controlled by several factors. The environment limits size to some degree

and inbreeding may also result in some size control. However, the general size of many of the animals is genetically controlled.

In the early fall of 1970, a mare with two colts was found. Both she and the colts were extremely emaciated. They were placed in a corral and treated by a veterinarian. Subsequently, the mare and one colt died. The remaining colt, a filly, was placed on a ranch and give free access to high quality forage. As a yearling she weighed 525 pounds, as compared to a yearling quarter horse filly who weighed 720 lbs.

This fact suggests that the size of the horses in the Pryors is at least somewhat genetically controlled.

7. Ancestry of the Pryor Horses

During the early phases of this investigation, many skeletons were observed and the condition of fusion of the lumbar vertebrae recorded. Supposedly, the "Spanish Barb Mustang" had 5 separate vertebrae while the Andalusion had the fifth and sixth lumbar vertebrae near the coccygeal, or tail vertebrae, fused. The quarter horse has six separate lumbar vertebrae while the arab normally has five. All variations of the above conditions were observed.

All breeds of horses used in the surrounding area probably have at one time or the other roamed the Pryor Mountains. Even today horses occasionally escape from the local ranchers and end up within the horse range.

8. Behavior

a. Agressive

Agressive behavior of the male animals varies in intensity at different times of the year. The peak is during the breeding season. Last spring (1971) the peak of activity and challenging was the first week of May. This peak corresponds very well with the peak of foaling (approximately May 15 - June 1). This is the date we would expect from the gestation period of 336-340 days.

The visual area of intolerance of other bands also seems to expand at this time. However, if a lone stud is harassing the harem stud attempting to capture mares, he seems to be tolerated at a closer distance - often 25 to 50 yards - but no closer. It was observed that a lone stud remained on the periphery of a harem for three days continually harassing the harem stud. At other times during breeding season, some of these lone animals roam through the range attempting to pick up a loosely held mare.

The physical encounters between male animals were always very brief in nature with sparring and threatening much more obvious than extreme physical contact. In these observations the challenging horse always submitted first and ran a short distance away from the harem. The harem stud would rarely chase him more than 100 yards. Instances of death of one of the

combatants was noted only once. This encounter was not observed, but the dead animal was found with the ground torn up around him. Death probably resulted from a lucky blow.

It is not known how often the challenging stud is successful. At times there is considerable interchange of mares. However, the actual exchange was observed only once. A bay male had a harem of five mares and 2 yearlings. A black male had been harassing the bay male for two days. On May 6, 1971, at 9:30 a.m., this group was approached for observation. The movement of the horses brought them within 30 feet of me, and I was eventually discovered. The horses ran off approximately 50 yards and turned to watch me. The bay male seemed to be watching a grulla female quite closely.

At this point the black male walked off with four of the females. It is recognized that the observer's presence had a tremendous influence on the outcome of this event. The bay male had two stresses confronting him and watched the observer more closely than he watched the black male.

The same bay stud was recorded on August 4, 1971, with the grulla mare. She now had a colt by her side. In addition, a buckskin 2-year-old stud was with him. This animal was roped and tattooed on November 9, 1971, and subsequently rejoined the same group. This same group of animals was observed several times during the month following the roundup. Then they were not relocated for several months. On March 21

the group was relocated with a spotting scope and now consisted of a total of 7 animals. Sexing and recordation of the group was not possible at this time. Two of the mares were obviously pregnant, one of which was the grulla mare.

The point of this discussion is that considerable interchange of animals between harems normally occurs. This trait is beneficial in limiting interbreeding through reshuffling of the gene pool. Numerous instances of interchange have been recorded during the period of this study, but it would be repetitious to repeat them.

It is believed that the behavior of the Pryor horses is affected by the extreme congestion of horses which accelerates the interaction of the animals. Marginal nutrition probably also influences behavior.

The sphere of intolerance shrinks after the breeding season and seems to be smallest during the winter months. However, groups of animals have been observed drinking from a spring during July within 15 yards of each other without exhibiting stress. Two groups, one of four bachelor studs, the other a normal harem group, were in continual conflict at the same waterhole. The harem stud chased the bachelors off time after time until his harem had their fill of water then they trailed off. The bachelor group was not aggressive and yielded quickly to the stud's pressure.

b. Stud Groups

The largest group of exclusively male animals observed in the Pryors was five. The average group was three animals. A stud group's sole function seems to be that of companionship. They are a loosely organized group, and there is always a dominant male animal who is the leader of the group. The standard dominant order or peck order is also present. The bond between these animals is not as strong as that of a harem group. The individuals often roam off by themselves for several days. They may rejoin the original group or some other stud group. If the male animal is approaching the age where he may be successful in obtaining a mare, he will remain alone for some time, especially during the breeding season. During this study male groups have never been observed attempting to obtain females through joint effort.

Ages of animals in stud groups inspected varied from yearlings to 5 years old. It seems that the age at which the young males are ejected from the harem unit varies considerably. Some studs seem more tolerant towards young males, and it has been observed that one young male remained with the harem group until at least three. Others will be forced from the harem group as yearlings. Due to the high death loss of young animals during the last three years, only limited opportunities have been available for observations on expulsion of young.

Immediately after expulsion the animal wanders around alone and seemingly lost. They make repeated attempts to join other harem groups as they are contacted. An instance where the animal was allowed to do so has not been recorded. The strange animals will be harassed from the group, not only by the stud but by other members of the group. Primarily by the lead mare but other members of the harem will participate when approached by the strange animal.

Older males that have held harem groups but have been replaced by a stronger animal will normally remain as lone animals. One instance of an older male, that had been replaced as harem stud, attempting to join a younger male group was observed. He was not allowed to do so.

The lone male as well as male groups do not seem to have the definable home ranges that harem groups exhibit.

c. Harem Organization

The average harem contains 3-4 animals (3.4). This agrees with the results of Pellegrini's study in Nevada. It is composed of a lead mare, a stud and subordinate mares or offspring. Larger harems sometimes have two studs. Both of them may at times breed, but one animal is always dominant.

The male animal's function is breeding and keeping the group intact. When the band is harassed by man, the stud will normally be the first to take off by himself. This was observed repeatedly during the roundup in November of 1971.

d. Following Instinct

Horses are very sociable animals and establish bonds of companionship within a group. It appears that in a harem group the lead mare dictates normal daily activity, except during periods of stress. She is normally the first to start towards water with the other horses following. She also leads the group from water to a foraging area. She intimately knows the trails and areas of traditional use.

In horses, the following instinct is highly developed, so much so in fact that when horses are separated from the group they are totally disoriented. Many instances of this were noted during this investigation. One group of horses was trapped within the fenced enclosure of Britton Springs. The lead animal escaped leaving the subordinate animals behind. They stayed within the fenced enclosure for two days even though the gates were left open.

In stud groups there is a dominant animal and the other animals follow him. As indicated under harem organization, the stud group is organized much more loosely and an animal will at times wander off by himself for several days.

9. Food Habits

Random feeding site observations were conducted during 1968 and 1969 on the horses. The major food item in their diet during the spring, summer and fall is grass. The most important grass

species are bluebunch wheatgrass and sandberg bluegrass. During the winter, brushy species, primarily saltbush, rabbitbrush and big sagebrush, are used extensively on some sites. Grass is also used where available.

Appendix 12 gives an idea of the type of data collected during these observations. More work needs to be done to determine the importance of brushy species in the winter diet of the horse and subsequently the degree of conflict between horses and mule deer.

10. Home Ranges

The horses in the Pryors have home ranges but do not establish territories. Considerable confusion has resulted from the use of these terms in biological literature. As used in this report the terms are defined as follows:

Home Range - That area or areas used by a group of animals and not defended. The area may or may not be used by other animals of the same species.

Territory - That area or areas used by a group of animals and defended. The area is used mutually exclusive of other animals of the same species.

Home ranges of the horses in the Pryor Mountains are seasonal. The home range presented in Appendix 13 is typical although some may be composed of as many as 5 areas.

If a number of home ranges were presented, intersection of lines at numerous points results in a confusing maze of lines.

The horses remained fairly well within defined areas except during the spring months. At this time they normally leave their traditional range and were found in numerous locations from mid-April through June. It is a matter of conjecture at this time, but it is assumed that they were moving in response to the green-up period. By July, they had established themselves on their summer range and remained there through September.

During the summer of 1972, at least 17 bands of horses used the same piece of country at least part of the time.

As indicated under Agressive Behavior, the sphere of intolerance varies at different times of the year. Pellegrini, in his study entitled "Home Range, Territoriality and Movement Patterns of Wild Horses in the Wassok Range of Western Nevada," says, "Wild horses establish a territory even though no special section of the home range exists as a defended area."

In the Pryors, during the winter months especially, applying the concept of territory to the defended area would be stretching the concept of territory. I prefer to call this a "sphere of intolerance." In some bands even this sphere of intolerance may be absent at times of the year and the animals may graze literally side by side.

The home ranges in the Pryors are changed as a response to 1. availability of water, 2. availability of forage, 3. weather conditions and 4. harassment, possibly as a result of congestion. Further discussion of this will appear under Distribution and Movements.

From the study of Steven Pellegrini in the Wassok Range of Nevada on the wild horses there, it is quite obvious that these animals are expressing the natural desire to establish territories. That is, areas are used by a specific group of animals mutually exclusive of other animals of the same species. It has also been noted that numerous large herbivores in Africa, for example, do establish and maintain territories. In the Pryor Mountains as indicated above, the horses do not establish specific territories but do establish and utilize a specific area common to them, and we term this the home range as mentioned above. It is believed that the horse is naturally a territorial animal and will, under uncrowded conditions, establish and protect territories for the benefit of the animals within the harem. In the Pryors, in the extremely congested situation that the horses have had there at least for the last several years, it appears that the horses have not been able to express their biotic potential. They have not been able to express their desire to establish a territory. There is simply not enough living space for the horses. There is not enough vegetation within a particular area that can be defended and utilized by one

specific band of horses. All animals require a certain amount of living space. At this time in the Pryors, it appears that the horses do not have the area available to them that is necessary for the establishment of territories.

11. General Distribution of the Horses by Season

The horse range can be physically divided into 4 areas: Area 1, The Dryhead; Area 2, Mystery Cave-Sykes Coulee; Area 3, Tillett Ridge; and Area 4, Low Country. These areas are further divided on the basis of seasonal use as follows: (Appendix #4)

a. Area 1 - Dryhead - North

Late Fall - Movement into this area is with the first permanent snows around mid-November. However, this year movement into this area occurred around mid-October with rains and then snows on October 26 and 27. The roundup conducted during November prevented recordation of whether the animals would have moved out of this country on their own when the area dried up during the first two weeks in November.

Winter - This winter, 71-72, the horses ranged farther north than last winter, 70-71. This is believed to be the result of the gradual adjustment to a new area.

A fence existed at the northern boundary of Area 2 at one time and kept the majority of the horses out of Area 1. In addition, ranchers used to harass the horses that were able to move into this area. During the winter of 70-71, the majority of the horses ranged only to the mid-point of Area 1.

Early Spring - Movement of the horses out of the Dryhead usually occurs when the snow melts and standing water sources dry up. This normally occurs by mid to late April. Last year, 1971, by approximately April 15 the horses moved out of the Dryhead.

b. Area 2 - Dryhead - South

The southeast portion of this area was used on a yearlong basis by a group of five horses. The northern limit of this area is the dividing line between summer and winter range on the Dryhead side. A small pocket of water at T_4 (Appendix #7) is used during the spring and later dries up.

c. Area 3 - Low Country

This area is used primarily during the summer - June 15 - October 1.

From the standpoint of vegetation, this area is in as poor a condition as any area in the horse range. The habit of summering in the low country is fostered by the availability of water at the three springs.

This area was used at times this last winter, 71-72, by two groups of horses. It is believed this was a result of the harassment imposed on the animals during the roundup. During the spring of 71, March-April, the area was devoid of horses.

d. Area 4

This area is used during the winter months. It is used at other times of the year but very lightly.

e. Area 5

Spring is the time of year this area is used the heaviest. There is also a period of time in the fall when it is used but not as heavily as in the spring. A few bands of horses also winter on the ridges blown free of snow. At least two groups of horses summered in this area.

f. Area 6

This area is almost entirely dominated by a stand of decadent Douglas fir. The closed canopy prevents any substantial growth of forage. Horses are occasionally seen in this area during the spring months grazing in small openings or utilizing forbs under the timber.

This is one of the few areas within the horse range that is not used extensively at some time of the year.

g. Area 7

This area is used to some extent at all times of the year. Primary utilization is made during the fall and winter months. The lower reaches are used lightly in the summer.

h. Area 8

This is one of the more unique areas within the horse range. It is an extremely steep slope of 65-70%. It is used extensively during the spring as the moisture is drying up in Areas 1 and 2. Water is usually available in the form of snow until late April. After observing the horses on this area for two springs, it still amazes me that they can make use of portions of this slope.

Other areas outside the horse range have also received use by the horses. Five horses wintered in Mystic Allotment just north of Area 6. Eight horses were on this area in November. Three horses either died or returned to the horse range.

Eight horses also wintered on the Forest Service north of Area 5.

This use outside the horse range is made possible by three factors.

1. Fence is broken down at north boundary of Area 6.
2. Horses can trail across Little Ice Cave Canyon and come out on Forest Service.

3. Gates being left open.

HUM's (Horse Unit Months) of use on the Forest Service were approximately 85 HUM's and 60 HUM's on the Mystic Allotment.

12. Population Counts

Numerous census have been conducted in the Pryors since 1968. The counts have been rather erratic because they were not standardized. They were conducted at different times of the year, different times of the day and often with several different observers.

It has been found that the horses are most observable just after green-up. This is probably related to several factors: 1. The horses are foraging all day; 2. The low angle of incidence of the sun makes the horses cast a larger shadow; 3. The snow has melted (causes a glare making it difficult to see horses especially when bare areas are alternated with snow); and 4. The slight green hue of the country makes the horses stand out.

Most of the counts were conducted with a helicopter. It seems impossible to miss anything when skimming over the country in one of these aircraft. Experience, however, has shown that animals are invariably missed even under ideal circumstances.

During the roundup and immobilization work, the animals' tails were cut off square as an aid in identifying them as having already been marked. After the roundup another count was made. The Peterson Index was used to arrive at a population estimate.

There was a known number of marked animals in the population. Using this method it is assumed the number of marked animals not counted will be proportional to the number of unmarked animals not counted. The results were as follows:

$$M = 53$$
$$N = 78$$
$$X = 32$$

$$N = \frac{(53)\ (78)}{32} = 129 \text{ animals}$$

Another census will be conducted in July of 1972. At that time a reliability index for census by helicopter in the Pryors will be prepared.

13. Population Control Vs. No Control

Recent studies have pointed out numerous animals that have "self imposed" population regulatory factors. As a rule, these factors are density dependent. As density increases, physiological and possibly psychological factors intervene in numerous ways to impose control on the population level. These ideas have been picked up by some and superimposed to the whole spectrum of animal populations.

Some proponents of this idea recommend letting the "balance of nature" solve the horse population problem in the Pryor Mountains. The "balance of nature" is a phrase that has been misused and largely misunderstood by the laymen. If a balance of nature actually exists, it is a precarious one at best. One thing is constant in nature, and that is constant change.

Glen Cole, of the National Park Service, has advanced a theory that in essence says that an animal cannot progressively destroy his habitat in a closed ecosystem. That is, if all the components are available in a natural system then the system will be self-perpetuating.

In the Pryor Mountains, we are working with an animal that is biologically classified as an "exotic" animal. In essence, this is an animal that did not evolve in the area in which it is occupying. The horse is a large and extremely competitive herbivore that, in the Pryors, has no regulatory factors placed on it besides disease and starvation. The low nutritional level of the animals also results in other regulatory functions: 1. Breeding age of male and female - 3; 2. Maximum breeding period - 5-6 years; 3. Possible reabsorption of embryos; and 4. Maximum life span - 10-14 years. However, the factors are not enough for timely regulation of population level.

Range condition and animal condition are inextricably interrelated. Studies have shown that animal condition lags behind a decline in range condition. All indications are that this lag is extreme in wild horses and as such we are a long ways down the backside of the curve in the Pryor Mountains.

Natural systems often work in a cycle of thousands of years. The geologic tearing down of mountains and production of soil is extremely slow. A limited area of 33,000 acres is now

available to the horses in the Pryors. The soil resource has been seriously depleted in past years. If this situation continues, the number of horses that can be supported in the Pryors will continue to decline. In essence, if the philosophy of allowing the horses to seek their own population level is adopted, we will ultimately destroy the recreation resource we are attempting to perpetuate, the horse.

I. CAPABILITIES AND OPPORTUNITIES FOR DEVELOPMENT WILD HORSES

A. Objective

Expansion of the existing boundaries of the Pryor Mountain Wild Horse Range would be returning wild horses to areas of historic use. Expansion is compatible with PL 92-195 and is also a sound management procedure. (PL 92-195, Appendix #11)

Adding areas of traditional use presents two distinct advantages
1. it would give the horses a better opportunity to express ingrained behavioral traits (territorial establishment) that have been denied to them under the crowded conditions prevalent on the range and
2. additional forage would be made available.

If we are to manage a wild horse population, we must give them every opportunity to express their biotic potential. Enhancing the "wild nature" of the horse is a management objective of paramount importance. A second, and related, management objective is the maintenance of a healthy, viable herd capable of expressing natural behavior.

The additional forage obtained from expansion of the horse range would serve as a buffer or reserve for the horses. Estimated time for re-establishment of the horses into new areas is two years. During this adjustment period, two possibilities exist 1. reduce the horses to the carrying capacity of the present range. Then, based on

distribution of the horses in expansion areas allow the horses to increase to carrying capacity of their respective areas of use.

2. Do not reduce the horses at the present time, but allow the horses to expand into new areas. This expansion may be facilitated by driving horses into the new areas.

The eventual goal is to provide healthy, productive horses capable of expressing their biotic potential on a healthy, productive range.

B. Habitat Expansion

Wild horses have occupied all of the Pryor Mountain Complex in the past. Man has now eliminated the horses on most of these areas.

Expansion of the habitat could occur if the barriers to movement of the horses were eliminated. The barriers to movement into additional areas are fences, private land and natural barriers. PL 92-195 states that expansion of horse herds into areas not occupied by wild horses on December 15, 1971, would not be considered. Areas considered below probably had wild - free roaming horses on them on the above mentioned date.

Overlay - Expansion Potential depicts areas to be considered. (Appendix #8)

1. Area 1 - Mystic Allotment - Acreage 2064 - C. C. 27 HU's
Horses seem to prefer this area during the winter months. The fence north of Mystery Cave is in poor repair and has allowed horses to enter this allotment. Last winter (1971-72) five horses wintered on Mystic Allotment and moved back into the horse range during the middle of May. Another group of horses used this area intermittently during the summer months.

The federal range is grazed by 150 cattle from 07/10 - 10/04 for approximately 182 AUM's. The total carrying capacity of the allotment is 332 HUM's and includes state and private land in addition to the federal.

This allotment is adequately watered and will provide both winter and summer range for horses. Use of this area by horses would be enhanced by obtaining both the private and federal lands.

2. Area 2 - Forest Service - Lost Water - Acreage 3948 - C. C. 40 HU's

This area is composed of grassy ridges separated by timbered canyons. Vegetatively it is presently in excellent condition. Cattle have not made use of this area in recent years due to lack of water. Wildlife use within this area is also spotty. The deer tend to move on through the area and winter within the wild horse range.

If this area is to be utilized as summer range, it will be necessary to construct a watering facility somewhere in Sec. 25, T. 8 S., R. 27 E., preferably in the NE¼.

This area was used during the 1971-72 winter by eight horses. It is interesting to note that in the harem of four horses two young were produced for the highest percent production per group in the horse range. This is indicative of the excellent forage conditions.

Five horses used this area during the summer of 1972.

With the removal of the fence, this would provide an excellent addition to the wild horse range.

3. Area 3 - Park Service - North of Sorensen Ranch - Acreage 7040 - C. C. 35 HU's

The dominant type within this area is juniper with interspersed grasses. This area has been used in the past by wild horses. A group of horses owned by the Tippetts have used this area intermittently, and the horses may be considered essentially wild.

This area joins the horse range and would make a logical addition. If the fence was removed, the horses would move around the Sorensen Ranch to the west.

The Sorensen Ranch is located within Area 3. This land is mostly irrigated and supports grasses as well as alfalfa. A log cabin in excellent condition would provide a living area and administrative site for a Wild Horse Manager. This old ranch would fit very well into the management program on the wild horse range. It is presently controlled by the National Park Service. Saddle horses used in the management of the horse range can be held here. Pastures could be constructed to hold horses pending disposition, and this area could also provide buffer forage during years of low productivity.

4. Area 4 - BLM - Crooked Creek Allotment - Acreage 3560 - C. C. 6 HU's

Rancher Lloyd Tillett uses this area in his livestock operation. A variable number of cattle forage out into this area during the winter months from Tillett's private land.

Horses that belong to Lloyd Tillett have also utilized this area. They are of the same genetic background as the horses within the wild horse range and may be considered wild.

Before construction of the boundary fence enclosing the horse range, horses made extensive use of this area. The State Section 36 was used by 30-35 horses during the winter months. Fencing off of this area removed considerable winter forage and resulted in overuse of other areas within the range.

The State Section as well as Crooked Creek Allotment would make logical additions to the range. This area would supplement the Dryhead as a wintering area.

5. Area 5 - BLM - Frail Lands and Demijohn Pasture - Acreage 7657 - C. C. 33 HU's

These areas have been used in the past by wild horses. It is not known for sure whether wild horses were on this land on December 15, 1971.

Excellent forage conditions exist on the Demijohn Pasture. The frail lands provide a smaller quantity of forage.

Crooked Creek Canyon essentially prevents movement of horses from the present horse range into the above areas. Trails could be constructed at two points to provide access for the horses to enter this area.

Both of these areas are within the Gyp Springs Grazing Allotment and are used by cattle.

An additional advantage of having horses on this area is increasing their viewability. Tourists driving down Crooked Creek would be able to view wild horses.

6. Area 6 - Little Mountain Area

Little Mountain is located on land administered by the National Park Service. Horses from the Pryors and from Tillett's private land have used this area in the past. Topographically this area is extremely rough. Vegetatively mountain-mahogany is the dominant type. Small meadows located on the foothills provide substantial forage. Little Mountain could be used as a supplementary pasture or as an area to relocate older horses not needed in the Pryors.

7. Additional Areas

Wild horses can feasibly occupy any area within the joint planning unit. Two livestock allotments on BLM, Gyp Springs and Bluewash would make excellent areas to establish new populations of horses. They could, in effect, act as a pressure relief valve to the overpopulated situation in the present wild horse range. All of Custer National Forest is also potential wild horse range. From

The standpoint of increased tourism, the advantage of having a large horse range is obvious. In addition, a large area would allow the horses more opportunity to express their natural behavior in a "wild" situation.

C. Land Trade Opportunities in Priority Listing

1. T. 9 S., R. 27 E., Sec. 36 - State Section.
2. T. 9 S., R. 27 E., Sec. 25, SW¼SE¼ - Private.
3. T. 8 S., R. 28 E., Sec. 16 - State Section.
4. T. 8 S., R. 28 E., Sec. 8, W½, SW¼NE¼, W½SE¼, SE¼SE¼.
5. T. 9 S., R. 28 E., Sec. 16 - State Section.

Note: Any of the private lands that could be acquired from Tillett's private land at the SW corner of the horse range to Tillett's private land at Sykes Spring would be a desirable addition to the horse range. The private lands primarily enclose the southern boundary of the horse range.

D. People Influence on Wild Horse Behavior

The Pryor Mountains have been a relatively isolated area for the majority of the public. As such, the horses have not been overly harassed by human activity except along the Dryhead road.

Wild horses in a casual association with man gradually become adjusted to man's presence. This is evidenced by the relatively tame behavior

of the horses along the Dryhead area. As indicated, road building activity and tourists have had an impact on the horses at this point.

Several effects are possible depending upon the approach to development in the Pryors.

	Development	Effect
1.	Maximum visitation and utilization by tourists. Elaborate road network and visitor use facilities.	Creation of a roadside horse menagerie.
2.	Moderate development, maintenance of existing trails.	Some horses will be affected in high use areas. Possibly freedom without fear - no need to be afraid of man.
3.	Limited development - elimination of some existing trails - concentration of use outside range except on Dryhead.	Horses along the Dryhead will be affected and those where use is concentrated.
4.	No development - elimination of existing trails.	Wild, rugged nature of Pryors and horses will be enhanced.

II. MANAGEMENT OPPORTUNITIES

A. Objective

The objective is to maintain a viable population of wild horses into perpetuity on a healthy, productive range.

The principles of "wild horse" management present no unique biological challenge. They revolve around two management methods, population control and proper distribution.

A flexible management plan is a necessity. A continuing review of factors affecting the horse is of paramount importance with management decisions fluctuating with environmental factors.

The ideas to be presented in this segment are by no means absolutes. As man delves deeper into the behavioral aspects of management of the wild horse, more management possibilities will undoubtedly evolve. In effect, the management potential will only be limited by the ingenuity of the manager.

B. Population Management Opportunities

1. Population Level

The population level necessary for the horses to express their biotic potential is not known at this time. If we assume that horses in a free roaming state establish and maintain territories (Pellegrini 1970), then we can assume that something is wrong in the Pryor horse range. A logical assumption is that under the present vegetation condition with the present acres (approximately 32,000) 130 wild horses are too many.

On the other end of the scale, there has to be enough horses interacting to establish competitiveness and natural selection. As an example, if there are not enough young studs around to challenge the harem studs for their control over the females, then a deteriorating situation will result with a less desirable herd being the ultimate result.

Severe inbreeding would also be a result of too low a population of horses. Competitiveness during the breeding season is absolutely essential.

It is felt that if the horses have an adequate amount of forage available to them, and they are not crowded in their attempts to obtain this forage, then the horses will gradually begin to express their ingrained behavior. The horse is not different than many other animals. When he is starving to death, many behavioral traits will be abandoned.

2. Population Enhancement

Once the base level of horses in the Pryors is reached, population reduction will become a simple process of culling the younger animals. It will be necessary to take older animals of both sexes to get down to the necessary level. It appears that the only option available for disposal of the older animals is putting them to sleep on the range.

As an example, the formula on the following page can be used to determine the number of animals to remove each year.

Hb = Base level of population

Ho = Percent death loss of older animals

Hd = Death loss of older animals

Xp = Percent productivity

Xy = Number of young animals produced

Xo = Percent death loss of younger animals

Xd = Death loss of younger animals

Xr = Number of young animals to remove

$$(Hb)\ (Ho) = Hd$$

$$(Xp)\ (Hb) = Xy$$

$$(Xy)\ (Xo) = Xd$$

$$Xy - (Hd + Xd) = Xr$$

We must realize that with management of this herd we will be increasing productivity and lowering the average death losses. These factors will increase our work load on removal of horses.

3. Carrying Capacity

A range survey has been conducted on the horse range which indicates a carrying capacity of 85 adult horses. The range trend has been steadily downward. Two options are available if the horse range is expanded. These were discussed under the objectives of expansion. If it is not expanded, the population must be reduced to 80-90 adult animals.

4. Type of Animal to be Removed

During the initial reduction, adult males were the only horses removed other than the colts. This was a logical decision based on the sex ratio (60% males, 40% females).

Bachelor studs and older harem studs were removed with a couple of exceptions. These exceptions were younger males that, due to size and nutritional state, would never be able to obtain a harem or contribute to the herd.

It is recommended that future reductions be based upon the following objectives:

a. Perpetuating an even age structure.

b. Improving the physical appearance of the herd.

c. Maintain a sex ratio in favor of the female.

In line with the above objectives, it is recommended that initially animals 9 and over be removed regardless of sex. These animals have, as a rule, reached a non-reproductive age and do not add to the vitality of the herd. Male animals of six through ten that have not been able to obtain a harem should also be considered for removal.

As indicated, few of the younger age classes have survived the last few years. Younger animals are desperately needed in the herd so they should not be removed unless absolutely necessary.

Age should not be the only criteria used to select animals for removal.

a. Physical Appearance

If an animal has poor conformation due to inbreeding or just general line of breeding, it should be considered for removal regardless of age.

It should be made clear that BLM is not in the horse ranching business. It is our objective to provide animals for the public to view.

We do believe the animals should be aesthetically pleasing. A 500 pound walking skeleton is not pleasant to look at.

The selection process should also be directed toward preserving the variety of colors now present. In particular, grulla, blue corn, roans and buckskins should be preserved for their line back and tiger stripe characteristics.

As indicated earlier, the mustang is a type of horse resulting from environment and breeding. Characteristically, he has a short, thick neck; blocky head; short back and is a small horse weighing around 800 pounds. The selective process should be designed to preserve this "type" of horse.

As a guide in the selection process, Kent Gregerson was kind enough to let us use his Conformation Guide. When reading this, some of these characteristics may seem mundane, but the majority of them may be seen on a horse when looked for by an experienced individual. During culling, every effort should be made to preserve the "Mustang" type horse and aid nature in her selective process as earlier discussed. See Appendix #18.

b. Sex Ratio

In a totally natural situation one would expect a balanced sex ratio of 50-50. As pointed out earlier, this was not the case in the Pryor Mountains. Psychologically, the mare was placed under more strain in the depleted environment so death loss was higher.

In line with the objective of perpetuating a viable, productive herd, the sex ratio should favor the female. As an additional advantage, fewer studs would lower the stresses placed on the harem stud during breeding season. This stress factor should not be eliminated however. The factor of natural selection should always be allowed to function. Strong, young animals with the capability of obtaining a harem should always be in the herd.

As a population sex ratio, Gregerson of the National Mustang Association recommended the following:

> That the number of studs be reduced to approximately 1/5 the number of mares with 10 additional young studs left for replacement and competition. This would allow approximately 15 normal harems of six animals each. Gregerson felt that if the intense competition between groups was reduced then productivity would be increased.

5. Method of Reduction

The reduction program conducted in November consisted of trapping and roping. Seven people participated on the ground. Most of these people were BLM employees with years of experience working with horses. This was an emergency, one-time operation and will not be repeated on this magnitude.

Economy of the operation is an overriding factor when choosing a method or methods of reduction. In the interests of economy, several methods will undoubtedly be employed. Possibilities are not limited to the following:

a. Trapping

   1. Water

   2. Dry

b. Roping

c. Immobilizing

d. Permit System

a - 1. Water Trapping

Water trapping has proven to be one of the more economical and successful methods of capturing horses. The dry season of late June to September is naturally the most productive.

During 1971 trapping was done at Sykes and Britton Springs. The method used was to sneak up to the gate and close it manually at 11:00 p.m. and 2:00 a.m. Success was increased if hay was scattered near the water to hold the horses in the trap longer.

It is recommended that electronic or trip devices be installed on the gates and that a holding pen be provided at each trap. Using this procedure, one would have to visit each trap only once each night. Any horses caught could be pushed into a holding pen and the gate reset.

Trapping did not influence some of the horses use of a particular water hole. Some groups of animals were caught night after night at the same water source.

Time of watering seems to vary widely even with the same group of horses. A variance as great as five hours was noted. Installation of automatic or trip gates would therefore enhance success.

It is necessary to have control of all the water sources in the immediate vicinity. See recommended developments, Appendix #8. Additional benefits of control of water sources will be covered under distribution. As in the Pryors, it is desirable to have more than one trap.

a - 2. Dry Trapping

Dry trapping or pushing horses into a trap is a successful method of capture if the traps are located with care. If the trap is visible to the horses, it is almost an impossibility to push the horses into it. In addition, the trap must be located on a natural trail. Preferably, where many trails feed in.

A trap was used successfully during the roundup in November. Approximately 50% of the 79 horses captured were captured in a trap. The trap was located in a steep-walled canyon just past a bend. Five feeder trails led into the bottom of the coulee so this trap served a large area. A minimum of work patched up one side and gates were installed on each end. Butyl rubber was draped over the gates to prevent the horses from hitting them.

It is recommended that a permanent pole trap be constructed at this location. Water can be piped down to this trap from a spring that is largely unavailable, thus converting it into a holding pen.

b. Roping

As opportunity presents itself roping is a method that can be used to select out individual animals on the range.

Roping on the range as a massive roundup is economically unfeasible. Too many riders are required to get the animals into a position for roping.

As a method of handling horses, roping is unexcelled. It is the most efficient, humane method of working horses in a corral.

c. Immobilization

The knowledge gained from the immobilization experience will be presented in a separate report.

Immobilization will be used as one technique in the management of these wild horses. With adequate cover, 2-3 horses can be captured per day. After certain variables are understood, this is a relatively safe technique of capture. This is a method that will be utilized to capture individual animals in country too rough for roping.

Immobilization will not be used as a technique to handle horses in a corral. Tranquilization may be occasionally used when transporting horses.

d. Permit System

Since BLM is going to be in the horse management business on a large scale, it was felt necessary to devise some method of reduction that would minimize BLM's manpower involvement. The permit system is the first idea in this direction.

This system would function similar to the permit systems used by many Fish and Game Departments. The number of animals and the type of animals to be removed would be determined by the resident biologist on the horse range.

During the early stages of this program, experimentation would be necessary to determine the percent success expected.

After this figure was known, permits would be issued at a level to obtain the necessary reduction.

Extremely close supervision would be necessary. The animals would have to be marked and examined before leaving the horse range.

Possibilities exist for specifying the particular horse a cowboy may capture. Method of capture may also be specified, roping for example.

The ideal month for an operation of this type is October. The weather has cooled off and the colts are generally old enough to keep pace with the older horses. If not, bands of horses with colts would not be allowed to be run.

Also, the horses should be physically at their peak. Mares at this time are not heavy with foal as they would have been pregnant only 3 or 4 months. An additional advantage is that a roundup at this time would not interfere with the general big game season.

The cowboy and the mustang are part of the history of the west. He has served as the primary predator on the horse population for years. It seems inconsistent to eliminate this means of population control. The permit system as a means of maintaining this relationship should be fully explored.

e. Biological Control

There are no natural predators that have an influence on the horses in the Pryors. The cougar is reputed to exert some influence on some wild horse populations in the west. As a means of biological control, a method such as this has a lot of appeal.

Introduction of a couple of cougars into the horse range should be further explored.

6. Disposal of Animals

This is one of the more difficult aspects of wild horse management. What to do with the excess horses?

As indicated earlier, this problem was solved during the initial roundup by giving the adult animals to the Crow Indians and the colts to Wild Horse Organized Assistance. The problem is now confronting us again. There are two alternatives: 1. Put the horses to sleep on the range or 2. Turn the horses over to private parties under the agreement of humane care.

When one looks at the potential disposal problem facing BLM in the west, the situation becomes frightening.

C. Distribution of Grazing Pressure

Two methods are available to distribute grazing pressure. The first is manipulation without physical barriers and the second a rest rotation program utilizing interior fences.

1. Water Manipulation

During the months of June through September, water manipulation or closing of certain water sources will provide a partial control over distribution. This method of distribution will not work during and shortly after rains. It has been found that immediately following a rain the horses disperse throughout the range using the rain water that has collected in numerous collection basins. It is obvious, however, that any method of limited control will never function perfectly.

2. Rest Rotation Management (Example - See Overlay) (Appendix #16)

This section is to serve as an example to point out that rest rotation systems will work on the Pryor Mountain Wild Horse Range.

The principles of providing periodic rest for portions of the range to improve or maintain its condition has been well documented in range science literature. Conversely, the detrimental effect of yearlong grazing has also been well documented.

A rest rotation system will work in the Pryors. (See Management Overlay)

Under this system a minimum of fencing is necessary with a maximum utilization of natural barriers. Drop panels would be constructed where the fence intercepted major trails. The two interior fences would intersect the corrals at Britton Springs and Sykes Corral. This would facilitate movement of horses from pasture

to pasture. The horses could be water trapped at these facilities and kicked out into the next pasture. Additionally, the drop panels along major trails could be lowered and horses moved into the next pasture.

Under this type of system, we could control not only lateral movement but also distribution within a pasture through opening and closing waters during a favorable season.

Many combinations of fence location, pasture numbers and seasons of use could be analyzed and the best system chosen.

Note: BLM Manual 4112.16D1 states:

> "Continuous grazing or yearlong grazing by livestock is not an acceptable grazing practice, and the Bureau's objective is to eventually replace yearlong grazing by noncontinuous grazing systems."

a. Effect of Rotation on Horse Behavior

Confining of horses into smaller units of land will increase the interaction between groups of animals. If the proposed additions, as depicted on overlay, are added, then the size of each pasture would be approximately one-third less than the present horse range. The management system should increase the available forage thereby providing the horses the opportunity to establish temporary territories if desired.

D. Range Improvements for Horses - "Artificial Manipulation"

The horse range has the capability of producing more forage for horses through management and/or development. The opportunities are spraying of sagebrush and a noncontinuous grazing system.

The horse range is presently supporting 120-130 head of adult animals and 20 colts. The range survey indicates the present range is capable of supporting 85 adult horses. The objective is to support a number of horses capable of expressing their biotic potential.

1. Recommendation Areas M-25, M-37 and M-38

Tabulations indicate that 1,223 acres of sagebrush, as shown on vegetative overlay, could be sprayed to increase forage production 179 AUM's. However, soil series 300 and 400 are not adapted to land treatment practices. Soil series 84B, 91B, 91C, 184C and 584B appear feasible areas for sagebrush spray. This comprises about one-half of the 1,223 acres. Therefore, the following is possible:

Spray 650 acres of sagebrush in the feasible areas mentioned above. This practice would increase the forage production by approximately 100 AUM's. Spray area should be differed from grazing for two years.

2. Water Spreader System

A water spreading system could be constructed to spread and utilize the water flowing intermittently down Big Coulee. The use of this water would promote the growth of more succulent vegetation and would provide more forage for the horses.

E. Introduction of New Blood

It may be desirable at some future date to introduce horses from other herds to add variety to the gene pool. As studies continue the level of inbreeding should become apparent and steps can be taken at this time.

It may be possible to enhance the horses in the Pryors by selecting the same type of horse presently in the Pryors. For example, we may be able to go to the brook cliffs and find a stud of the same type of horse that would not pollute the present genetic strain yet increase the probability of genetic interaction.

On the other hand, the horse presently in the Pryors is what nature and the selective process have produced. He has "adapted" to his environment to a degree and has carved out an ecological niche. Introduction of new genetic material must be carefully evaluated.

F. Advisory Committee Recommendations

The Pryor Mountain Wild Horse last advisory recommendations are made a part of this report - Appendix 15. Generally, these recommendations are outdated. We either have done or are doing the majority of the recommended steps.

Recommendation 9, however, needs to be carried through.

G. Future Possibilities

The field of scientific animal management is rapidly expanding. It is difficult to speculate on possible developments that may aid in the distribution of free-roaming animals. At the present an animal repellent is being experimented with. This agent, when sprayed on vegetation, repels the animal for which it was intended. If this procedure could be developed to the point where it is economically feasible, the problem of animal distribution would be essentially solved.

In the future other standard animal distribution tools will be tried, such as enticements to relocation. Distribution of salt is a method which has been used for years to obtain distribution of livestock. It may be of benefit in managing free-roaming horses.

Supplemental feeding is also a possibility. It should be stressed again that feeding of these horses is not a sound management possibility. However, if certain palatable foods were scattered sparingly in an area, this might be the enticement necessary to hold the horses in a desirable area. This will be tried in the future.

Certain groups are now working on birth control methods for free-roaming wild animals. A group has proposed a research project on birth control in wild horses. It may be that research will solve a portion of our population control problem.

APPENDIX # 1

FEDERAL REGISTER, VOL. 33, NO. 178—THURSDAY, SEPTEMBER 12, 1968

MONTANA AND WYOMING

Establishment of Pryor Mountain Wild Horse Range

1. Pursuant to the Classification and Multiple Use Act of September 19, 1964 (74 Stat. 986, 43 U.S.C. 1411), R.S. 2478 (43 U.S.C. 1201), the Act of October 15, 1966 (80 Stat. 913; 16 U.S.C. 460t), and the provisions of 43 CFR Subpart 1727, I hereby designate the public lands in the following described area as the Pryor Mountain Wild Horse Range and establish the rules for management of said Range.

MONTANA PRINCIPAL MERIDIAN

CARBON COUNTY, MONT.

T. 8 S., R. 28 E.,
Sec. 19, N½E½;
Sec. 20, all;
Sec. 21, W½, W½E½;
Sec. 28, W½;
Sec. 29, all;
Sec. 30, N½E½;
Sec. 31 N½E½;
Sec. 32 all;
Sec. 33 W½, W½SE¼.

T. 9 S., R. 27 E.,
Sec. 1, all;
Sec. 2, all;
Sec. 11, all;
Sec. 12, all;
Sec. 13, all;
Sec. 14, all;
Sec. 23, NE¼, E½SE¼;
Sec. 24, all;
Sec. 25, W½, NE¼, N½SE¼, SE¼SE¼.
T. 9 S., R. 28 E.,
Sec. 4, W½, W½E½, E½SE¼, SE¼NE¼;
Secs. 5–36, all lying west of the Bighorn River.
T. 9 S., R. 29 E.,
Sec. 18, all lying west of the Bighorn River.
T 10 S., R. 27 E.,
Sec. 1, lots 1 and 2.

SIXTH PRINCIPAL MERIDIAN

BIGHORN COUNTY, WYO.

T. 58 N., R. 95 W.,
Sec. 19, lot 1;
Sec. 20, N½;
Sec. 21, N½, SE¼, northeast diagonal ½ of SW¼;
Sec. 22, all;
Sec. 23, W½W½, E½NW¼, NE¼SW¼, N½SE¼;
Sec. 26, NW¼NW¼;
Sec. 27, N½;
Sec. 28, NE¼NE¼.

The area described aggregates approximately 32,000 acres.

The Pryor Mountain Wild Horse Range is a Class III natural environment area under the Bureau of Outdoor Recreation system of classification.

2. Subject to valid existing rights the area will be primarily administered for the protection and management of wild horses, wildlife, watershed, recreation, archeological, and scenic values.

3. The Pryor Mountain Wild Horse Range shall be in all respects subordinate to the Bighorn Canyon National Recreation Area established by the Act of October 15, 1966 (80 Stat. 913; 16 U.S.C. 460t), so far as it affects lands comprising any part of the Bighorn Canyon National Recreation Area. Wild horses within the area shall be managed by the Bureau of Land Management, in a manner that is compatible with the purposes for which the Bighorn Canyon National Recreation Area was established.

4. The Bureau of Land Management, for the public lands within the Range, and in cooperation with the National Park Service for the lands within the National Recreation Area, will develop and keep current a management plan for the Range which will provide for the management of the wild horses and their habitat within a balanced program which considers all public values and without impairment of the productivity of the land.

5. For purposes of management of the wild horses within the Range, the boundaries thereof shall conform to natural barriers and feasible fencing routes within the area described in paragraph 1 of this order. The lands are more particularly identified and delineated on plats or maps filed in the respective Land Offices. Lands which lie outside the mentioned boundaries will be subject to existing domestic livestock grazing under the Taylor Grazing Act.

STEWART L. UDALL,
Secretary of the Interior.

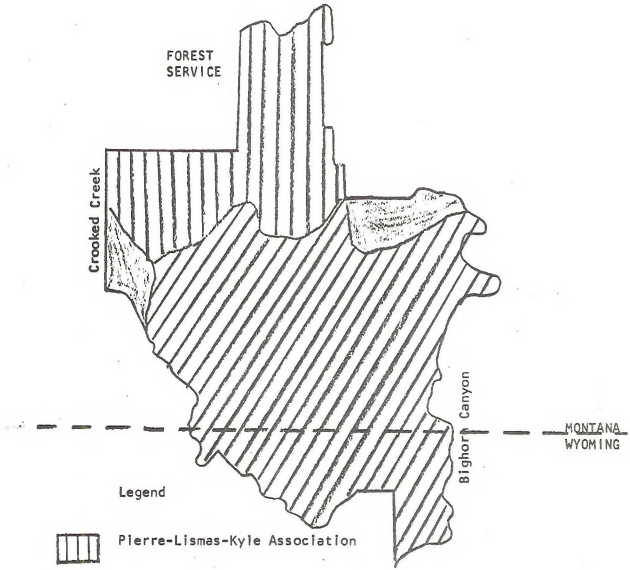
SEPTEMBER 9, 1968.

[F.R. Doc. 68-11058; Filed, Sept. 11, 1968; 8:49 a.m.]

APPENDIX # 2

Pryor Mountains Wild Horse Range

Soil Association



Legend

Pierre-Lismas-Kyle Association

Midway-Travesilla-Lismas Association

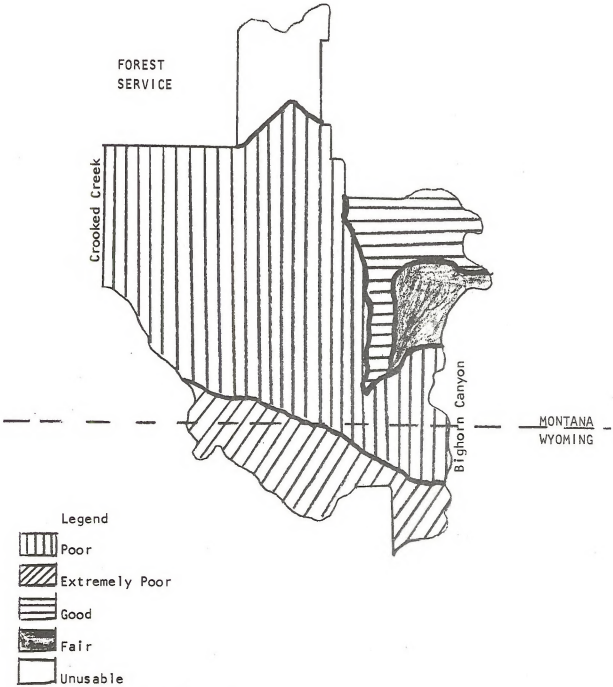
Shorey-Stormitt-Garvin Association

*Scale is ½ inch to the mile.

APPENDIX # 3

Pryor Mountain Wild Horse Range

General Range Condition

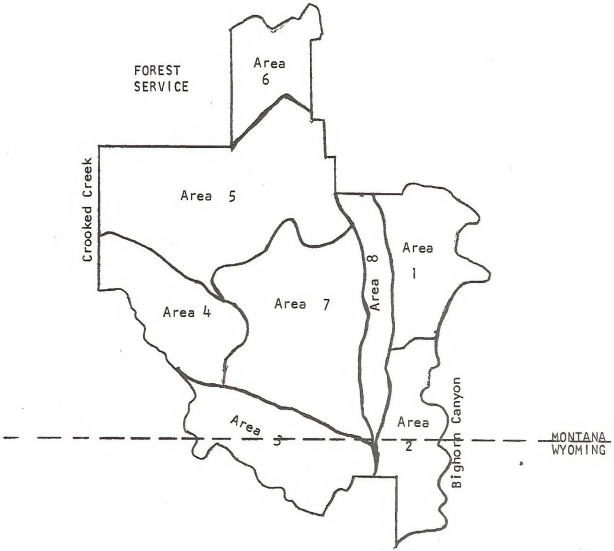


*Scale is $\frac{1}{2}$ inch to the mile.

APPENDIX # 4

Pryor Mountains Wild Horse Range

Seasonal Use Area



*Scale is $\frac{1}{2}$ inch to the mile.

APPENDIX # 5

Pryor Mountain Wild Horse Range

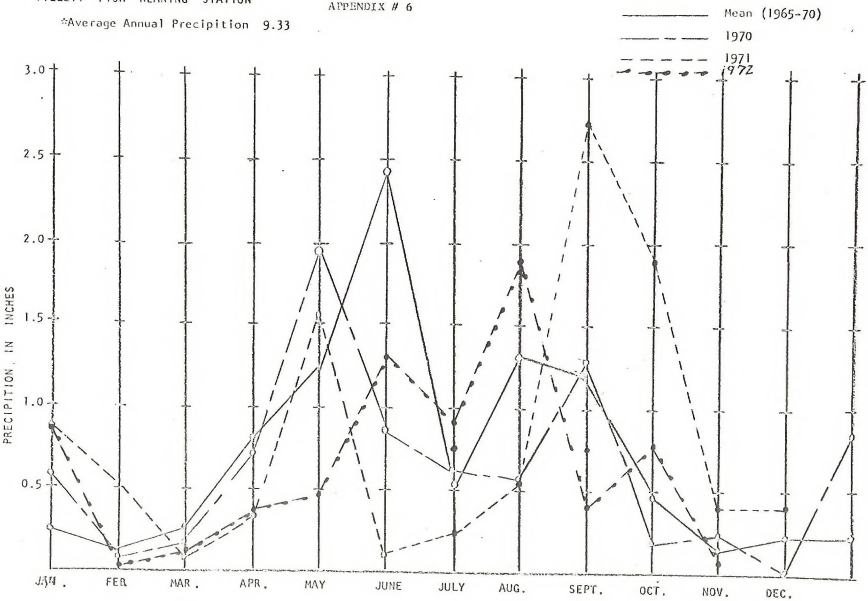
Tillett Fish Rearing Station Precipitation Data (Inches)

	1965	1966	1967	1968	1969	1970	1971	1972
Jan.	1/ .31	T	.04	.09	.41	.58	.87	.89
Feb.	1/ .13	T	.32	.11	.00	.09	.52	.03
Mar.	1/ .28	T	.93	.11	.06	.17	.06	.38
Apr.	1/ .23	1.06	1.01	.39	1.50	.71	.33	.40
May	1/ 1.82	.27	.86	1.64	.89	1.99	1.58	.97
June	1/ 1.91	.81	3.75	3.03	4.33	.86	.05	1.29
July	.58	.18	.54	.79	.42	.63	.22	.92
Aug.	2.56	1.83	.38	2.25	.30	.57	.59	1.93
Sept.	1.33	1.95	.51	1.43	.64	1.29	2.73	.43
Oct.	.43	.53	.54	.18	1.01	.19	1.90	.74
Nov.	T	.02	.17	.25	.14	.25	.42	.15
Dec.	T	T	1.09	.29	.04	01	.46	
Total	9.58	6.65	10.14	10.56	9.74	7.34	9.73	

TILLETT FISH REARING STATION

APPENDIX # 6

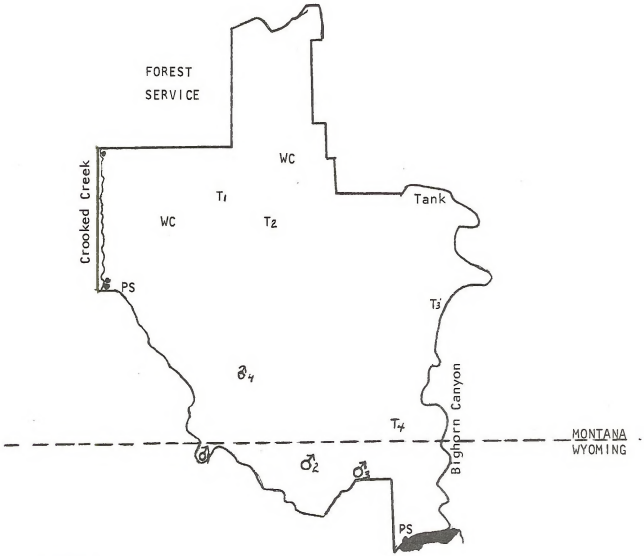
*Average Annual Precipition 9.33



APPENDIX # 7

Pryor Mountains Wild Horse Range

Water Resources



Legend

WC Water catchment

T Temporary

PS Perennial stream

Spring

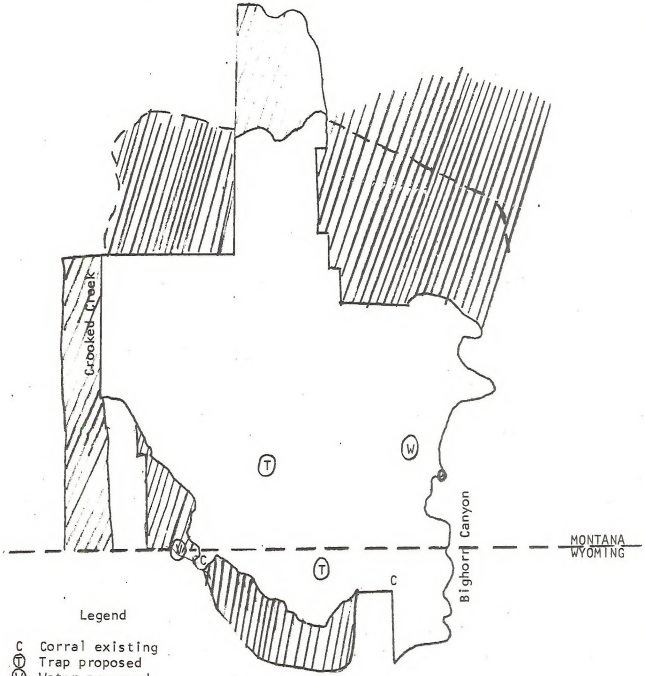
Access to Stream

Available lake water

*Scale is one ½ inch to the mile

APPENDIX # 8

Developments Proposed- Existing
Expansion Areas



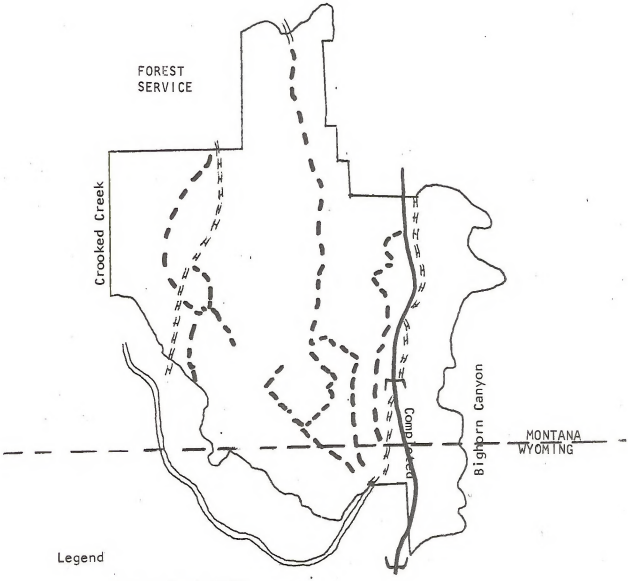
Legend

C Corral existing
(T) Trap proposed
(W) Water proposed
O Overlook existing
(V) Visitor Center Proposed
/// Proposed expansion
*Scale is ½ inch to the mile.

APPENDIX # 9

Pryor Mountains Wild Horse Range

Roads and Trails



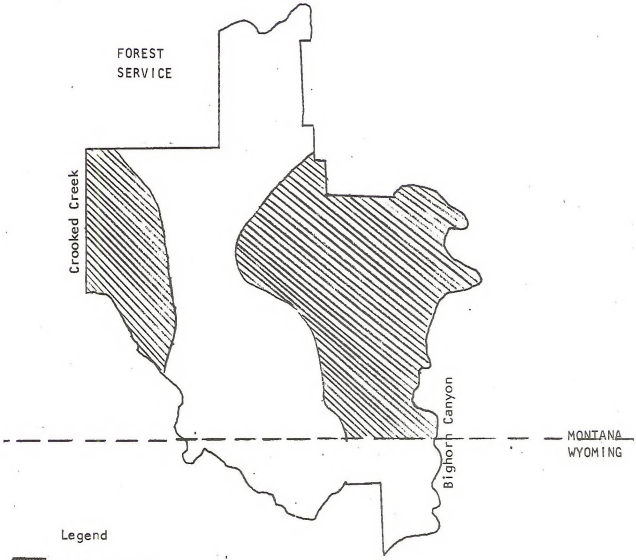
Legend

County Road
Primitive Road
Trails
New Road

*Scale is ½ inch to the mile.

APPENDIX # 10

MULE DEER WINTER HABITAT



Legend

Critical Range

Useable Range

*Scale is $\frac{1}{2}$ inch to the mile.

Public Law 92-195
92nd Congress, S. 1116
December 15, 1971

An Act

85 STAT. 649

To require the protection, management, and control of wild free-roaming horses and burros on public lands.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Congress finds and declares that wild free-roaming horses and burros are living symbols of the historic and pioneer spirit of the West; that they contribute to the diversity of life forms within the Nation and enrich the lives of the American people; and that these horses and burros are fast disappearing from the American scene. It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands.

Wild horses and burros. Protection.

SEC. 2. As used in this act--

Definitions.

(a) "Secretary" means the Secretary of the Interior when used in connection with public lands administered by him through the Bureau of Land Management and the Secretary of Agriculture in connection with public lands administered by him through the Forest Service;

(b) "wild free-roaming horses and burros" means all unbranded and unclaimed horses and burros on public lands of the United States;

(c) "range" means the amount of land necessary to sustain an existing herd or herds of wild free-roaming horses and burros, which does not exceed their known territorial limits, and which is devoted principally but not necessarily exclusively to their welfare in keeping with the multiple-use management concept for the public lands;

(d) "herd" means one or more stallions and his mares; and

(e) "public lands" means any lands administered by the Secretary of the Interior through the Bureau of Land Management or by the Secretary of Agriculture through the Forest Service.

SEC. 3. (a) All wild free-roaming horses and burros are hereby declared to be under the jurisdiction of the Secretary for the purpose of management and

Jurisdiction; management.

protection in accordance with the provisions of this Act. The Secretary is authorized and directed to protect and manage wild free-roaming horses and burros as components of the public lands, and he may designate and maintain specific ranges on public lands as sanctuaries for their protection and preservation, where the Secretary after consultation with the wildlife agency of the State wherein any such range is proposed and with the Advisory Board established in section 7 of this Act deems such action desirable. The Secretary shall manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands. He shall consider the recommendations of qualified scientists in the field of biology and ecology, some of whom shall be independent of both Federal and State agencies and may include members of the Advisory Board established in section 7 of this Act. All management activities shall be at the minimal feasible level and shall be carried out in consultation with the wildlife agency of the State wherein such lands are located in order to protect the natural ecological balance of all wildlife species which inhabit such lands, particularly endangered wildlife species. Any adjustments in forage allocations on any such lands shall take into consideration the needs of other wildlife species which inhabit such lands.

Destruction or removal, authority.

(b) Where an area is found to be overpopulated, the Secretary, after consulting with the Advisory Board, may order old, sick, or lame animals to be destroyed in the most humane manner possible, and he may cause additional excess wild free-roaming horses and burros to be captured and removed for private maintenance under humane conditions and care.

(c) The Secretary may order wild free-roaming horses or burros to be destroyed in the most humane manner possible when he deems such action to be an act of mercy or when in his judgment such action is necessary to preserve and maintain the habitat in a suitable condition for continued use. No wild free-roaming horse or burro shall be ordered to be destroyed because of overpopulation unless in the judgment of the Secretary such action is the only practical way to remove excess animals from the area.

(d) Nothing in this Act shall preclude the customary disposal of the remains of a deceased wild free-roaming horse or burro, including those in the authorized possession of private parties, but in no event shall such remains, or any part thereof, be sold for any consideration, directly or indirectly.

Private maintenance.

SEC. 4. If wild free-roaming horses or burros stray from public lands onto privately owned land, the owners of such land may inform the nearest Federal marshall or agent of the Secretary, who shall arrange to have the animals removed. In no event shall such wild free-roaming horses and burros be destroyed except by the agents of the Secretary. Nothing in this section shall be construed to prohibit a private landowner from maintaining wild free-roaming horses or burros on his private lands, or lands leased from the Government, if he does so in a manner that protects them from harassment, and if the animals were not willfully removed or enticed from the public lands. Any individuals who maintain such wild free-roaming horses or burros on their private lands or lands leased from the Government shall notify the appropriate agent of the Secretary and supply him with a reasonable approximation of the number of animals so maintained.

Recovery rights.

SEC. 5. A person claiming ownership of a horse or burro on the public lands shall be entitled to recover it only if recovery is permissible under the branding and estray laws of the State in which the animal is found.

Agreements and regulations.

SEC. 6. The Secretary is authorized to enter into cooperative agreements with other landowners and with the State and local governmental agencies and may issue such regulations as he deems necessary for the furtherance of the purposes of this Act.

Joint advisory board.

SEC. 7. The Secretary of the Interior and the Secretary of Agriculture are authorized and directed to appoint a joint advisory board of not more than nine members to advise them on any matter relating to wild free-roaming horses and burros and their management and protection. They shall select as advisers persons who are not employees of the Federal or State Governments and whom they deem to have special knowledge about protection of horses and burros, management of wildlife, animal husbandry, or natural resources management. Members of the board shall not receive reimbursement except for travel and other expenditures necessary in connection with their services.

Penalty.

SEC. 8. Any person who--

(1) willfully removes or attempts to remove a wild free-roaming horse or burro from the public lands, without authority from the Secretary, or

(2) converts a wild free-roaming horse or burro to private use, without authority from the Secretary, or

(3) maliciously causes the death or harassment of any wild free-roaming horse or burro, or

(4) processes or permits to be processed into commercial products the remains of a wild free-roaming horse or burro, or

(5) sells, directly or indirectly, a wild free-roaming horse or burro maintained on private or leased land pursuant to section 4 of this Act, or the remains thereof, or

(6) willfully violates a regulation issued pursuant to this Act,

shall be subject to a fine of not more than $2,000, or imprisonment for not more than one year, or both. Any person so charged with such violation by the Secretary may be tried and sentenced by any United States commissioner or magistrate designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions as provided for in section 3401, title 18, United States Code.

Power of arrest.

(b) Any employee designated by the Secretary of the Interior or the Secretary of Agriculture shall have power, without warrant, to arrest any person committing in the presence of such employee a violation of this Act or any regulation made pursuant thereto, and to take such person immediately for examination or trial before an officer or court of competent jurisdiction, and shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of this Act or regulations made pursuant thereto. Any judge of a court established under the laws of the United States, or any United States magistrate may, within his respective jurisdiction, upon proper oath or affirmation showing probable cause, issue warrants in all such cases.

Limitation.

SEC. 9. Nothing in this Act shall be construed to authorize the Secretary to relocate wild free-roaming horses or burros to areas of the public lands where they do not presently exist.

Report to Congress.

SEC. 10. After the expiration of thirty calendar months following the date of enactment of this Act, and every twenty-four calendar months thereafter, the Secretaries of the Interior and Agriculture will submit to Congress a joint report on the administration of this Act, including a summary of enforcement and/or other actions taken thereunder, costs, and such recommendations for legislative or other actions as he might deem appropriate.

The Secretary of the Interior and the Secretary of Agriculture shall consult with respect to the implementation and enforcement of this Act and to the maximum feasible extent coordinate the activities of their respective departments and in the implementation and enforcement of this Act. The Secretaries are authorized and directed to undertake those studies of the habits of wild free-roaming horses and burros that they may deem necessary in order to carry out the provisions of this Act.

Studies.

Approved December 15, 1971.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 92-480 accompanying H.R. 9890 (Comm. on Interior and Insular Affairs) and No. 92-681 (Comm. of Conference).

SENATE REPORT: No. 92-242 (Comm. on Interior and Insular Affairs).

CONGRESSIONAL RECORD, Vol. 117 (1971):

June 29, considered and passed Senate.

Oct. 4, considered and passed House, amended, in lieu of H.R. 9890.

Dec. 2, House agreed to conference report.

Dec. 3, Senate agreed to conference report.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 7, No. 51:

Dec. 17, Presidential statement.

GPO 65-139

Appendix # 12

FEEDING SITE OBSERVATION

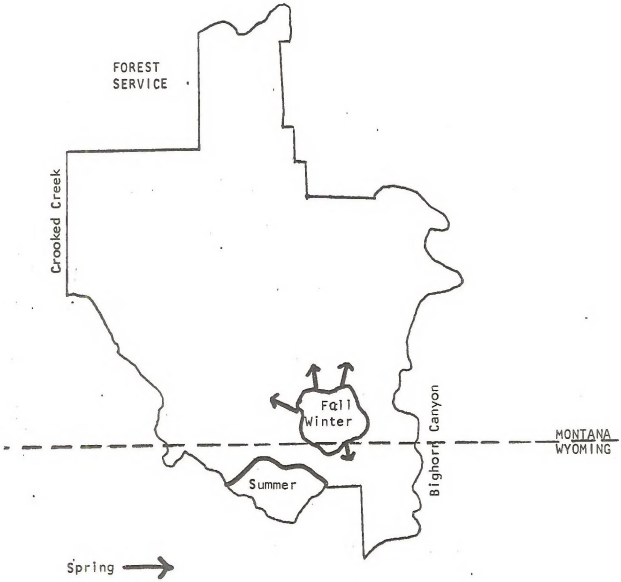
Observation Site No.	Canopy Coverage-Total	Canopy Coverage of Key Species Plant	Individual Plant Utilization	Average Utilization of Key Forage Plant
1	36%	Bluebunch wheatgrass-6.9%	Bluebunch wheatgrass-30% Sandberg bluegrass -43% Bluegrama -37%	38%
2	7.3%	Bluebunch wheatgrass-2.3%	Bluebunch wheatgrass-22% Sandberg bluegrass -100%	34%
3	13.8%	Blue grama -2.1%	Blue grama -100% Alkali sacaton -100%	58%
4	7.8%	Alkali sacaton -2.8%	Alkali sacaton -80%	72%
5	5.9%	Bluebunch wheatgrass-2.0%	Bluebunch wheatgrass-70% Sandberg bluegrass -83% Prairie Junegrass -43%	62%
6	7.2%	Bluebunch wheatgrass-3.1%	Bluebunch wheatgrass-62% Sandberg bluegrass -50%	58%
7	6.9%	Sandberg bluegrass -.25%	Sandberg bluegrass -66%	72%
8	7.5%	Prairie Junegrass -3.5%	Prairie Junegrass -38% Sandberg bluegrass - 8%	40%
9	10.2%	Bluebunch wheatgrass-2.5%	Bluebunch wheatgrass-64% Sandberg bluegrass -15%	56%
10	4.2%	Indian ricegrass -.38%	Indian ricegrass -66%	76%
11	4.5%	Bluebunch wheatgrass-2.4%	Blueguncwheatgrass-74% Sandberg bluegrass - 5%	56%
12	13.9%	Red threeawn -2.8%	Red threeawn -58% Sand dropseed -100%	No Data

Adverse conditions prevented using the standard method on 10 sites.
Direct observation was used on those.

APPENDIX # 13

Pryor Mountain Wild Horse Range

Home Range of One Band

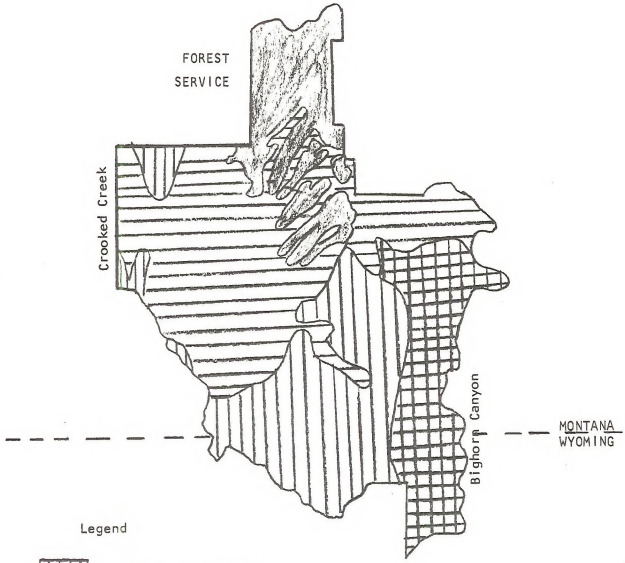


*Scale is ½ inch to the mile.

APPENDIX # 14

Pryor Mountains Wild Horse Range

Vegetative Types



Legend

Shrubs and Brush

Juniper

Juniper, Shrubs, and Brush

Conifer

*Scale is $\frac{1}{2}$ inch to the mile

APPENDIX #15

REPORT OF THE PRYOR MOUNTAIN WILD HORSE ADVISORY COMMITTEE MEETING OF SEPTEMBER 27-29, 1971, TO THE DIRECTOR OF THE BUREAU OF LAND MANAGEMENT

The Special Advisory Committee for the Pryor Mountain Wild Horse Range, meeting in Billings, Montana, and vicinity, September 27-29, 1971, reached the following conclusions and recommendations:

1. The committee recommends that the Bureau of Land Management explore the possibility of expanding the horse range to include the Sorensen Allotment (State Section 36), 1,000 acres of usable range in the National Forest, and the Tillett-Sykes spring land. Since the Bighorn Highway does bisect the southeastern portion of the wild horse range and does actually remove some land from grazing, it would appear appropriate that the Sorensen Ranch, now administered by the Park Service be made available for wild horse use.

2. The committee recommends that the Bureau of Land Management be furnished with sufficient manpower and/or funding to put a man in Bridger or Lovell permanently to police the horse range.

3. Because of additional information gathered by the committee during the past year, we feel that the loop road should not be constructed. The new information is related to protection of archaeological and aesthetic values which exist profusely throughout the wild horse range.

4. The committee recommends that no further improvement of present roads be made and tourise traffic be kept to a minimum; pending coordination and review, of planning and design by the Forest Service and the Bureau of Land Management within the next few years.

5. Because of forage conditions at present and strong evidence of declining range condition and because of the time required to obtain additional land, it is recommended that the wild horse numbers be reduced commensurate with forage supply with allowances for range recovery, but there should be no more than 50 percent reduction at the present time. This is to prevent undue suffering by starvation and winter kill. According to the total number of horses on the enclosed range at present, this is consistent with the previous recommendations of the committee.

6. The committee recommends that the herd be reduced in the following manner:

   (a) This year's foals be taken off the range and cared for by support from private funds and an effort be made to find good homes for them.

   (b) The sale or giving away of horses to those interested in owning a Pryor Mountain Wild Horse, but with the stipulation that these animals can under no circumstances be slaughtered. A lip tattoo will help to guarantee and prevent this.

(c) Surplus bachelor studs be given to the Crow Indian Tribe to be placed on their reservation for use by the tribe but not to be sold for slaughter.

(d) Old, sick and crippled horses should be disposed of in a humane manner and left on the range.

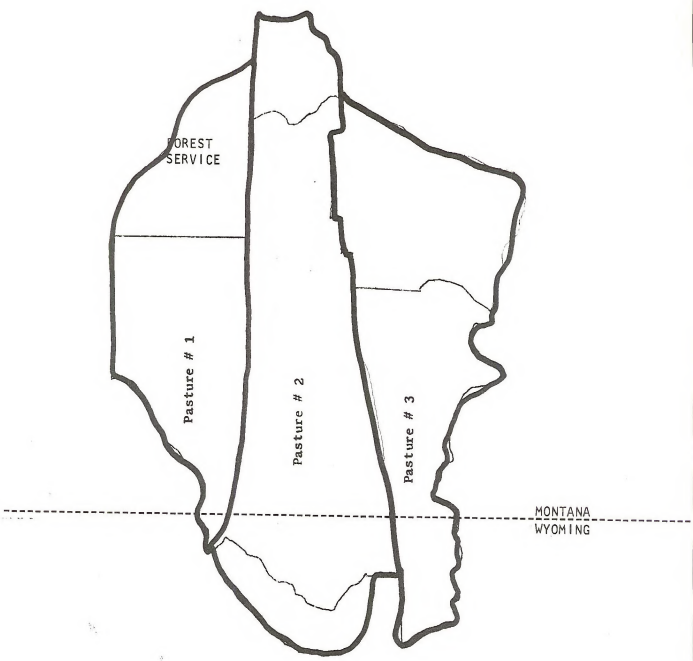
7. The committee recommends that intensive studies be continued on horse behavior, horse food habits, horse genealogy, and condition and trend of the wild horse range. An intensive survey of soil and site conditions should be carried out to determine if there are areas suitable for artificial rehabilitation as a means of increasing forage.

8. Because the Bureau of Land Management has the accountability for the wild horses on the range, it is recommended that they continue the lip tattoo practice until all horses are tattooed.

9. Due to the starvation crisis facing the wild horses this winter, restrictions should be imposed immediately on the 33 ranchers who trail approximately 8,000 head of cattle through the horse range. Each rancher should be required to trail through in no more than one day or move his cattle by truck. In order to save as much forage as possible for the wild horses, no cattle should be allowed to drift across the range.

APPENDIX # 16

Pryor Mountains Wild Horse Range
Rest Rotation System



*Pastures include potential expansion areas

COOPERATIVE AGREEMENT
BETWEEN
THE BUREAU OF LAND MANAGEMENT
AND
THE NATIONAL PARK SERVICE

THE BIGHORN CANYON NATIONAL RECREATION AREA
AND ADJACENT PUBLIC LANDS

I. General

A. The purpose of this agreement between the Bureau of Land Management (Bureau) and the National Park Service (Service) is to implement the objectives of the Act of October 15, 1966 (P.L. 89-664). By delegation of authority from their respective Directors, the Bureau is represented jointly by the State Directors of Montana and Wyoming; the Service is represented by the Regional Director, Midwest Region.

B. The Bighorn Canyon National Recreation Area (hereinafter referred to as recreation area), encompasses an area of significant land use created by the Yellowtail Dam and Reservoir as depicted on Boundary Map LNPMW-010A-BC, November 1964. Any boundary adjustments for the recreation area will be accomplished in accordance with the applicable provisions of the act providing for the establishment of the recreation area, and shall observe the principle of including only such land as is needed to effectuate the purposes set out in section 1 (a) of such act.

C. Within this recreation area, public outdoor recreation is recognized as the dominant or primary use to be made of the available resources. Natural resources not required for recreational uses may be utilized and managed for other purposes where such uses are compatible with the recreational purpose of the area, and where they do not significantly impair public recreation and conservation of scenic, scientific, historic or other values contributing to public enjoyment. Primary emphasis is placed on active participation in outdoor recreation in a pleasing environment.

D. On Bureau lands adjacent to the recreation area, management and developments will give full consideration to environmental aesthetics and the impact upon the recreation area.

E. Under the provisions of the Taylor Grazing Act of 1934 and the Classification and Multiple Use Act of 1964, the Mineral Leasing Act, and other acts, the Bureau is responsible for the management of public lands and resources under its administrative jurisdiction outside the recreation area, in harmony with and according to multiple use principles. It is recognized that management of the lands within the recreation area is the responsibility of the Service in accordance with the provisions of the Act of October 15, 1966 (P.L. 89-664). The major purpose

of this agreement is to assure that the skills and abilities of the two agencies which are parties thereto will be applied to assure maximum public benefit and proper management of the lands within and adjacent to the recreation area.

II. Grazing

A. In keeping with the objectives of Public Law 89-664, the Service shall be responsible for determining what lands within the recreation area may be used for grazing, and for assuring that such use will be compatible with, and will not impair, public recreation and conservation of scenic, scientific, historic, or other values contributing to public enjoyment of the recreation area. The Bureau will administer grazing habitat in conjunction with adjoining lands currently administered by it outside the recreation area.

B. Any proposal, advanced either by grazing licensees or permittees, or the Bureau for the construction, use or continuance of range improvements within the recreation area, including but not limited to roads, trails, fences, tanks, and any other facilities related to grazing use, will be submitted to the Superintendent of the recreation area for approval.

C. Proper range management practices must be observed by range

users and range rehabilitation, conservation and improvement projects will be authorized by the Bureau and initiated as circumstances warrant. No disturbance of the land surface or natural vegetation will be permitted in connection with range improvement practices within the recreation area without first securing approval in writing from the Superintendent of such area.

D. No permit or license will be issued for grazing in the areas described as follows:

a. Bureau of Reclamation administered area surrounding Yellowtail Dam (to be defined and described by the Bureau of Reclamation); and

b. Public recreation sites and administrative use areas as determined by the Service.

E. If requested by the Service or the Bureau, representatives of the Service and the Bureau will jointly inspect recreation area lands as a basis for authorizing, denying or modifying grazing privileges for the succeeding grazing season.

F. The grazing fees prescribed by the Secretary of the Interior for grazing within the adjacent grazing districts will govern fees charged within the recreation area. The collection of

grazing and range improvement fees will be the responsibility of the Bureau, and such fees will be distributed in accordance with existing law.

G. Temporary improvements on lands within the recreation area must be removed within 90 days of termination of the grazing privileges to which the improvements appertain or earlier upon request of the Superintendent of the recreation area.

H. The Service shall cooperate with the Bureau in actions involving trespass by domestic livestock under Bureau permit within the recreation area. In cases of repeated trespass, the Bureau shall, upon the request of the Service, cancel the permit or license of the offending range user.

I. Cost of fences, cattleguards or other facilities required to effect exclusion of domestic livestock from public recreation sites and administrative use areas shall be borne by the agency requiring such exclusion.

J. Pryor Mountain Wild Horse Range

a. The Pryor Mountain Wild Horse Range shall be in all respects subordinate to the Bighorn Canyon National Recreation Area established by the Act of October 15, 1966 (80 Stat. 913; 16 U.S.C. 460t), so far as it affects lands comprising any

part of the Bighorn Canyon National Recreation Area. Wild horses within the area shall be managed by the Bureau of Land Management, in a manner that is compatible with the purposes for which the Bighorn Canyon National Recreation Area was established.

b. The Bureau of Land Management, for the public lands within the Range, and in cooperation with the National Park Service for the lands within the National Recreation Area, will develop and keep current a management plan for the Range which will provide for the management of the wild horses and their habitat within a balanced program which considers all public values and without impairment of the productivity of the land.

III. Mineral Leasing

The Bureau will refer mineral leasing applications to the Service for approval or stipulation.

IV. Miscellaneous

The Service and the Bureau agree further that:

A. The Bureau and the Service shall cooperate in the preparation of an overall plan for the recreation area and adjoining public lands. Such plan shall depict and describe zones of permissible

land usage within and adjacent to the recreation area and guidelines for local administrative actions with respect to the various land uses currently in effect or contemplated. The Service shall be responsible for determining what are permissible land uses within the recreation area, consistent with the provisions of Public Law 89-664, and the Bureau shall be responsible for determining permissible uses of the public lands adjacent to the recreation area. These agencies will meet as necessary, and at least once each year to review resource programs operating within and adjacent to the recreation area, to consider and agree upon changes in the management plan for the recreation area and its environs.

B. Subject to the provisions stated herein, requests for rights-of-way and other special land uses, etc., which involve both agencies, will be jointly reviewed using the approved management plan as the basis for administrative action by the responsible administering agency.

C. They will coordinate interpretive planning and installation of interpretive facilities.

D. They will cooperate in fire prevention and control.

E. They will participate in training programs which will contribute to more efficient and effective management of the recreation area and adjacent public lands.

This agreement may be amended at any time by mutual consent of the agencies which are parties hereto, and it shall remain in effect until terminated by written notice of either one of such agencies to the other, or by direction of the Secretary of the Interior.

BUREAU OF LAND MANAGEMENT

Ed Pierson, State Director, Wyoming

MAY 13 1969

Date

NATIONAL PARK SERVICE

Fred C. Fagergren, Regional Director, Midwest Region

5/20/69

Date

Edwin Zaidlicz, State Director, Montana

APR 30 1969

Date

Wild Horses of Canada: Norma Bearcroft
J. A. Allen & Co. LTD, London 1966

The Mustangs. Boston: Little Brown and Co., 1934

Home Range, Territoriality and Movement Pattern of Wild Horses in the Wassok Range of Western Nevada: University of Nevada, Reno. 1971

America's Last Wild Horses: Hope Ryden

MUSTANG CONFORMATION GUIDE

By Kent Gregersen

MUSTANG CONFORMATION GUIDE

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INTRODUCTION

Some twenty years of research has been done before forming definite conclusions compiled in this conformation guide. The horse herein described can not be duplicated in any other country. Therefore it is concluded, this horse is "Native" of the North American Continent. This contradicts the United States horse history that has been accepted for many years.

The only horse that comes near this "Native Barb", for conformation, is the African Barb that was lost and re-generated from what little Barb blood was left, Arab, Numidian and Syrian horses.
This regenerated Barb has some differences from the Native Barb we are describing here.

Reference: French Journal 1929; reprinted by the United STates Cavalry Journal and copyright in 1929.

The horses introduced to the United STates from 1519 forward is the Andalusian breed from Spain. Andalusians, being a mixture of Barb, Arab, and Norse Horse do display some Barb characteristics. The other bloodlines are strong enough in this breed to easily distinguish them from the "Native Barb".

A suffix is included on the Andalusian for the purpose of seperating the two breeds in the readers mind. This breed, because of their longtime association in the United States, I will also classify as Mustang.

As of this date (1973) there remains no more than three hundred of these unique "Barb" horses in the United STates. Can America afford to loose this remaining few? More, in a diluted stage do exist throughout the Southwest.

Many horses classified as other breeds will show some Barb characteristics. The Barb being the oldest, is one of the strongest breeds. Therefore, the Barb can absorb more outside blood and still retain his identity than any other breed.

Many characteristic have a purpose in helping the horse live in an extremely harsh environment, while others listed are merely identifications from other breeds.

The "Native Barb" of some years back would have been all dun colors

with very little or no white markings. White markings developed as controlled breeding was practiced by man.

Brighter colors crept into the Mustangs in America after the horses from Spain were introduced. The brighter colors being desired by man, while nature demanded the natural or dun colors.

There were no straight Barb horses introduced from Spain into the United States. Those from Spain were all of the Andalusian descent. If one knows the conformation and how to identify these horses, a definite pattern can be formed of the way the Andalusian breed spread in the United States.

The early Conquestidors from Spain, brought their language and many phrases and words that are still used today. The one that has been most grossly mis-used is applying the word "Spanish" to all Mustangs.

++++++++++++++++++++++++++

MUSTANG CONFORMATION GUIDE

Revised January 4, 1973

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1. The Barb head is the convex form. This will vary to some degree; as each animal has personal features that identify them from others of the same breed. The overall head is short. Plate 1.

2. The jaw is full, rounded and large. Although this is a stud feature; it shows distinctively on Barb mares. Plate 1.

3. The throat latch is clean and high; follows the rounded jaw high up the sides. Plate 1.

4. The jaws are wide between, at the throat entrance.

5. Nostrils are small and crescent shaped. They expand fully when horse is exerted for unhampered air flow. When viewed from the front; extra space between the nostrils is prefered. Plate 1.

6. The mouth is shallow and firm. Plate 1.

7. The bulges on the forehead are bone. (Morgan is also bone). In domestic horses these bulges are muscle.
   NOTE: These bulges are more pronounced in stallions. Plate 1.

8. The shoulders are more flat and slab shaped. Plate 1.

9. The chest is deep but not extremely wide. Plate 1.

10. There is a perfect "A" (sometimes refered to a "V") between the front legs. Plate 1.

11. The ears are short, dark rimmed and have a deep dish at inner top. Plate 2.

12. The withers are medium to low. Studs show a pronounced extra muscle on each side, blending into the back. Plate 3.

13. The shoulder slope is extreme. Plate 3.

14. Barbs have only five vertebrae in the lumbar section of the spine. No. 13 and 14 combine for the overall appearance of the short back and long underline.
    NOTE: To check vertebrae, lay fingers between hip bone and floating rib. Barb should be no more than four fingers.
    One and two less pairs of ribs has also been noted. Plate 3 and 6.

15. The neck blends into the chest almost vertical; giving the chest a deep sloppy look. No definite break in throat-chest connection as shown in domestic breeds. Plate 3.

16. The stifle joint is low, but horse does not show a gaunt look. Plate 3.

17. The front end is proportioned larger than the back end. (opposite of man made quarter horse). Mares are balanced from the point a man would set on a horse bareback. The larger shoulders and neck is pronounced in the stallions. Plate 3.

18. The croup is medium rounded, but not goose or hatchet. Plate 3.

19. The tail is medium low set. The root is wide and extremely bushy. Frosted (gray or lighter color) dock shows on the roan and dun colored horses. Plate 2.

20. The shoulder point is very prominent when viewed from the rear at an angle. (45o±). Plate 4.

21. The hip joints are set low giving the croup a nice oval shape. Even when excessively fat, there is no crease down the rump. Plate 4.

22. The mane crest is wide; especially in stallions, giving a full and even double mane. Wavey mane and tail common. Plate 2.

23. The body and hair contains an oil. This makes the hair shine and is real noticeable on the legs.

24. The body hair has the crinkley appearance as deer, antelope, etc.. (Not known if this hair is hollow).

25. Hooves are small and extremely hard. The shell is much thicker than found in domestic breeds. The sole grows out with the shell. Does not thrush away as in domestic horse. The outside of the shell is ringed, (rippled).

26. Colors.
The Barb is predominately the various shades of dun, although any solid color may appear. Usually mealy nosed. Duns have the dorsel stripe, rings on legs and sometimes the darker patch over the withers. Many variations of this camouflage stripe will appear. Plates 2,3,4.

27. The Barb is between 13 hands and 14 hands. (4 inches to a hand). They weigh from 700 pounds (mares) to 1050 pounds (stallions).

28. The chestnuts on front legs are small and raindrop shaped. Rear chestnuts are small or absent. Chestnuts stay shed off and do not protrude outward.
NOTE: These are the ideal chestnut for the Barb. Some variances are allowed. (More research needed on this). Plate 5.

29. The pasterns, front and rear, are short; but have extreme flexibility. Plate 5.

30. No groove shows between the leg bone and the tendons. This area is fibered in smooth and shows no sign of the groove. (Groove - called: broken tendon). Plate 5.

31. Fetlocks are curley but the hair is not very long. Could be termed a clean limbed breed. Plate 5.

32. The hind legs have a "comb". The hair combing crosswise on the hind legs. Plate 5.

33. Small or no ergots. (More research needed here). Plate 5.

34. The cannon bones are perfectly round.

35. A full inside gaskin nuscle on the hind leg. Plate 5.

36. Their temper has been described as "Velvet and Steel". They display extreme intelligence in both wild and domestic states. They are easy to train and never forget.

ANDALUSIAN

37. The Andalusian has a higher, more pronounced poll in the neck. Also more natural arch in the neck.

38. Andalusian's are taller and slimmer than Barbs and are more refined.

39. Andalusian has, a generally, straighter facial profile. The face and head show strong hints of their Arabian descent. Overall, they show the dressy look, so well liked by the Spanish people who developed the breed.

40. The iris of the Andalusian eye has a clearity and depth not seen in other breeds. This is hard to describe, but once seen it is not forgotten.

41. The Andalusians are a man made breed and brought the brighter colors to America. These developed into several offshoots of color phase in the hands of the American Indians. They also escaped into the wild to mingle back among their Barb ancestors. Varying mixtures of Barb-Andalusian are still found in the western United States today. The Andalusians have the Spanish (Avero) paint among them. The Tobiano pinto has not been found among them.

42. Andalusians have five and one half or five and a fused vertebrae in the lumbar section of the spine. Plate 6.

43. Andalusians range between 13 hands and 14 hands 2 inches. (four inches to a hand).

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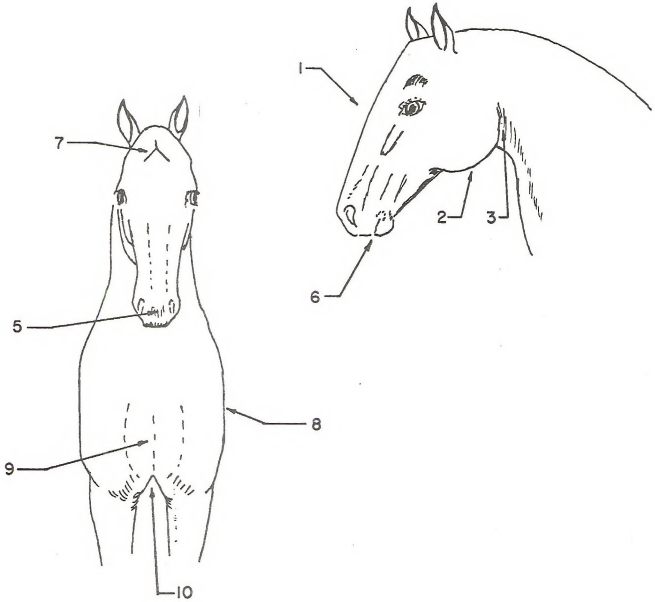


PLATE I

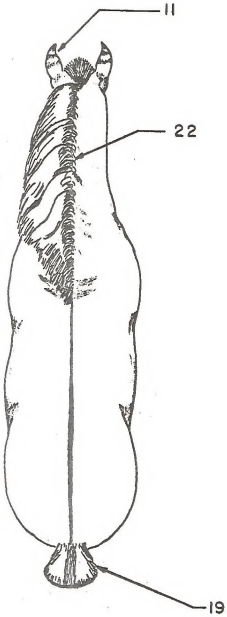


PLATE 2

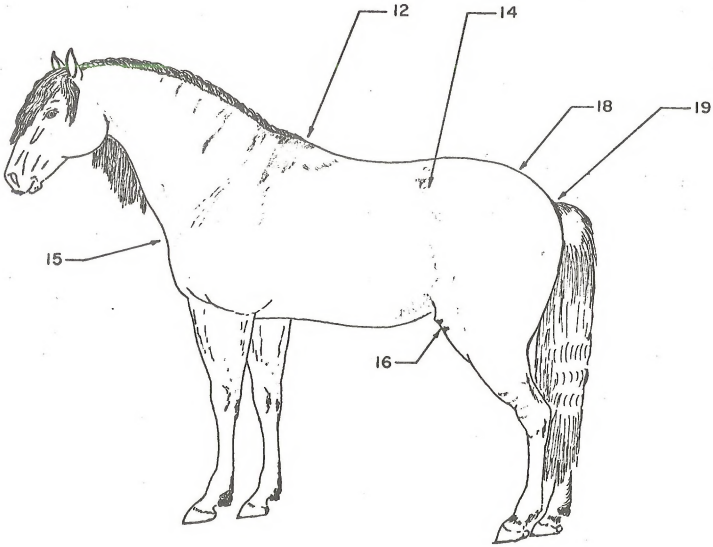


PLATE 3

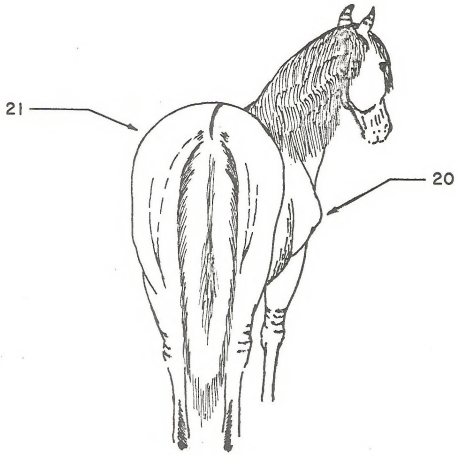


PLATE 4

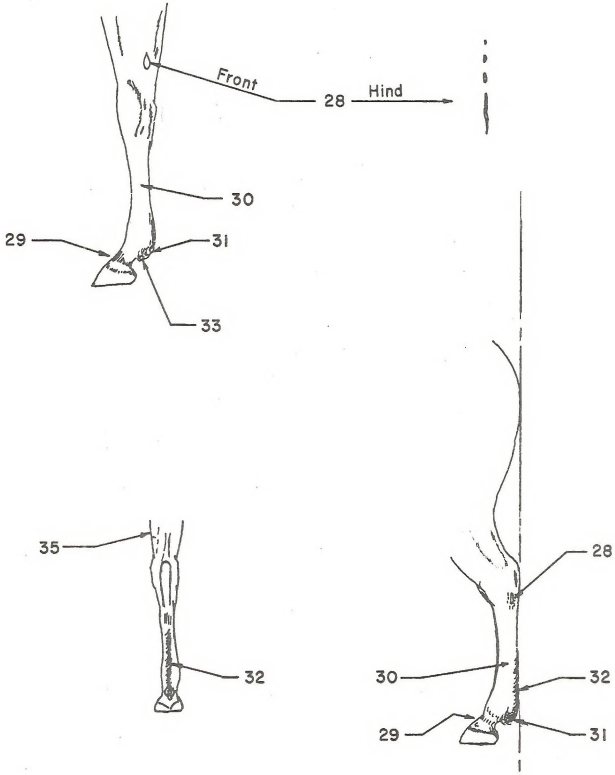
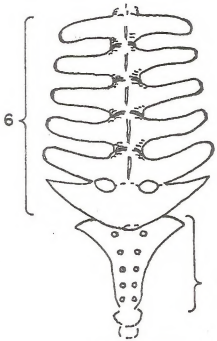
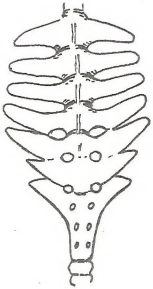


PLATE 5

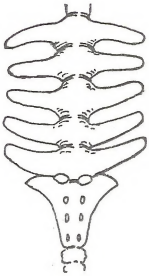
LUMBAR VERTEBRAE



MAN MADE
DOMESTIC BREEDS



5 1/2
ANDALUSIAN



5
BARB

MUSTANGS

PLATE 6

Form 1279-3
(June 1984)

BORROWE

SF 360.3 .M9 W54

Wild horse biology
alternatives for m

DATE LOANED	BORROWER

USDI – BLM